Test oil IS SI

# ZEXEL - TEST VALUES

ISO 4113 or		Di	stributo	r pumps				BOSCH No	. 9 460 610 395
SAE J967d		En	gine mod	el: NEWHA				ZEXEL No	. 104740-0114
								Date:	31.01.1992 [0]
								Company:	MAZDA
Injection pump no.: 10464	0-0344	(N	P-VE4/10	F1900RNP51)				No.	SE0813800B
Pump rot.: Clockwise-view	ed from drive	side Te	st-nozzle	e holder combin	nation:		Те	st pressur	e line:
		1	688 901	000			1 680 750 017		
1. Setting values		P	. Speed	Setti	ng values		Charge-a	air pressur	Difference in
			(rpm)				bar (mmHg)		delivery (cc)
1-1 Timing device travel			1500	5.0 - 5.4 (m	m)				
1-2 Supply pump pressure	,		1500	5.7 - 6.3 (k	g/cm²)				
1-3 Full load delivery			1000	53.1 - 54.1 (c	c/1000st)				3.5
Full load delivery				(c	c/1000st)				
1-4 Idle speed regulation	1	, 	350	10.8 - 14.8 (c	c/1000st)				2.5
1-5 Start			100	above 78.0 (c	c/1000st)				
1-6 Full-load speed regul	ation		2100	19.1 - 25.1 (c	c/1000st)				5.5
1-7 Load-timer adjustment					·····			·····	
2. Test values									
2-1 Timing device	N = rpm		1000	1500	1900				
	mm		1.6-2.8	4.9-5.5	7.0-8.2			<b>r</b>	
2-2 Supply pump	N = rpm	500		1500	1900			3. Dimer	nsions
	kg/cm <sup>2</sup>	2.3-2.9		5.7-6.3	7.1-7.7				
2-3 Overflow delivery	N = rpm		1000					К 3.	.2 - 3.4 mm
	cc/10s		53 - 91	7				KF 5.	.7 - 5.9 mm
2-4 Fuel injection quanti	ties							MS 1.	7 - 1.9 mm
Speed control lever pos.	P. Speed	Fuel d	elivery	Charge-air	Differe	ence in		BCS	– mm
	(rpm)	(cc/1	000st)	pres(mmHg)	deliver	cy (cc)		Pre-st. 0.1	.8 - 0.22 mm
End stop	1000	52.6	- 54.6					Control le	ver angle
	500	45.6	- 49.6					α 1	.8°- 22° deg
	1500	50.3	- 54.3					A 35.	9 - 38.6 mm
	1900	46.4	- 50.4					β 3	3°-43° deg
	2100	19.1	- 25.1					B 10.	2 - 13.9 mm
	2200	below	6.0					γ	- deg
								C	– mm
Switch off	350		0						
Idle-	350	10.8	- 14.8						
stop	below 620		0						
2-5	Cut-in volt	age max.:	16V						5
Solenoid	Test voltage	e: 24 - 2	6V						

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ZEXEL - Test specifications Injection pumps



ZEXEL - Test specifications A2 Injection pumps

Test oil	:	ZEXEL - TH	EST VA	LUES					1/2
ISO 4113 or		Di	stributor	pumps				BOSCH No.	9 460 610 387
SAE J967d		Eng	gine mode	el: 4D56				ZEXEL NO.	104740-3643
								Date:	31.01.1992 [0]
								Company:	MITSUBISHI
Injection pump no.: 10464	0-3353	(N)	P-VE4/10F	2100RNP430)		-		No.	MD103207
Pump rot.: Clockwise-view	ed from drive	side Te	st-nozzle	holder combi	nation:	• • •	Те	st pressure	line:
		1 (	<b>588 901 0</b>	00			1	680 750 017	
1 Setting values		Þ.	Speed	Setti	ng values		Charge-a	ir pressure	Difference in
2. Detting values			(rpm)				bar	(mmHg)	delivery (cc)
1-1 Timing device travel			1250	3.5 - 3.9 (m	nm)		540	) - 560	
1-2 Supply pump pressure			1250	4.5 - 5.1 ()	$(g/cm^2)$		540	) - 560	
1-3 Full load delivery			1250	61.4 - 62.4 (c	cc/1000st)		540	) - 560	4.5
Full load delivery			750	60.4 - 61.4 (c	cc/1000st)		. 320	) - 340	
1-4 Idle speed regulation	1		375	6.5 - 9.5 (c	cc/1000st)			0	2.0
1-5 Start			100	63.0 - 83.0 (c	cc/1000st)			0	
1-6 Full-load speed regul	ation		2650	22.2 - 28.2 (c	cc/1000st)		540	) - 560	5.5
1-7 Load-timer adjustment	· · · · · · · · · · · · · · · · · · ·		1250	$\Gamma = 0.4 - 0.8$ (n	nm)		540	) - 460	
2. Test values	· · · · · · · · · · · · · · · · · · ·				·····				
2-1 Timing device	N = rpm	500	750	1250	2100				
	mm	0.6-1.8	1.4-2.6	3.3-4.1	6.6-7.8				-
2-2 Supply pump	N = rpm		600	1250	2100			3. Dimen	sions
	kg/cm <sup>2</sup>		2.9-3.5	4.5-5.1	6.5-7.1				
2-3 Overflow delivery	N = rpm			1250			· _	К 3.2	2 - 3.4 mm
	cc/10s			48.0-92.0		1		KF 5.1	7 - 5.9 mm
2-4 Fuel injection quantit	ties							MS 0.9	9 - 1.1 mm
Speed control lever pos.	P. Speed	Fuel d	elivery	Charge-air	Differe	ence in		BCS 3.6	5 - 3.8 mm
	(rpm)	(cc/1	000st)	pres(mmHg)	deliver	ry (cc)		Pre-st.	– mm
End stop	1250	60.9	- 62.9	540 - 560				Control lev	ver angle
	600	45.8	- 50.8	0				α 55	5°- 63° deg
•	750	59.9	- 61.9	320 - 340				A 10.9	9 - 16.0 mm
	2100	52.8	- 57.8	540 - 560				β 38	3°-48° deg
	2650	20.2	- 30.2	540 - 560				B 12.1	L - 15.6 mm
	3050	below	5.0	540 - 560				γ	- deg
						•		C	- mm
Switch off	375		0	0					· ·
						<u></u>			
Tate-	600	below	3.0	0					14
stop	375	6.0	- 10.0	0					
2-5	Cut-in volt	Lage max +	BV						
Solenoid	Test volta	re: 12 - 14	4V	$\overline{\mathbf{O}}$					
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ZEXEL - Test specifications Injection pumps

ZEXEL - Test specifications Injection pumps

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1. Adjustment

1) Fix the control lever in the position satisfying the following conditions:

Boost	t Pressure	•	540 - 560	mmHg
Pump	Speed	:	1250	rpm
Fuel	Injection	Quantity:	49.8 - 50.8	cc/1000st

2) With the control lever positioned as described in 1) above, adjust the governor sleeve so that the Timer Stroke conforms to the specified values (1 - 7).

2. Confirmation of Timer Characteristics

Fix the control lever in the position satisfying the following conditions, and confirm the Timer Stroke.

Contro	l lever position	Specified values			
Pump speed (rpm)	Fuel injection quantity (cc/1000st)	Boost pressure (mmHg)	Timer stroke (mm)	Timer stroke reduction value (mm)	
1250	49.3 - 51.3	540 - 560	(3.1)	0.2 - 1.0	
1250	38.7 - 41.7	540 - 560	(2.3)	0.8 - 2.0	

- 1. After adjusting full Q of 1250 rpm, set the boost pressure, at 750 rpm, at 330 mmHg or 0.45 kg/cm<sup>2</sup>, and adjust Q using the BCS spring's set screw.
- 2. Adjust the timing device stroke at a boost pressure of 550 mmHg or 0.75 kg/cm<sup>2</sup> by moving the control lever to the full Q position.



ZEXEL - Test specifications Injection pumps

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Test oil ISO 4113 or SAE J967d

ZEXEL - TEST VALUES

Distributor pumps

Engine model: 4D56

										Comp	bar
Injection pump no.: 10464	0-3353		(NF	-VE4/10	F2100RNP430)	· · · · · · · · · · · · · · · · · · ·		· · ·		No.	
Pump rot.: Clockwise-view	ed from drive	side	Tes	st-nozzle	e holder combi	nation:			Tes	t pre	255
			16	88 901	000			يدرون من من و	16	80 75	50
1. Setting values			Ρ.	Speed	Setti	ng values		Char	ge-a:	ir pr	es
				(rpm)					bar	(mmHo	<u>J)</u>
1-1 Timing device travel			-	1250	3.5 - 3.9 (	mm)			540	- 56	0
1-2 Supply pump pressure				1250	4.5 - 5.1 (	kg/cm²)			540	- 56	0
1-3 Full load delivery				1250	61.4 - 62.4 (	cc/1000st)			540	- 56	0
Full load delivery				750	60.4 - 61.4 (	cc/1000st)			320	- 34	0
1-4 Idle speed regulation	L			375	6.5 - 9.5 (	cc/1000st)				0	
1-5 Start				100	63.0 - 83.0 (	cc/1000st)				0	
1-6 Full-load speed regul	ation			2650	22.2 - 28.2 (	cc/1000st)			540	- 56	0
1-7 Load-timer adjustment				1250	T-0.4-0.8 (1	mm)			540	- 56	0
2. Test values				T	·						
2-1 Timing device	N = rpm	500	0	750	1250	2100					
	mm	0.6-1	. 8	1.4-2.6	5 3.3-4.1	6.6-7.8			-		
2-2 Supply pump	N = rpm			600	1250	2100				3. Di	<u>i m</u>
	kg/cm <sup>2</sup>			2.9-3.5	4.5-5.1	6.5-7.1					
2-3 Overflow delivery	N = rpm				1250				. 1	К	
	cc/10s				48.0-92.0				7	KF	
2-4 Fuel injection quantit	ties								r	MS	
Speed control lever pos.	P. Speed	Fue	l de	elivery	Charge-air	Differe	ence in		I	BCS	
	(rpm)	(c	c/1(	000st)	pres(mmHg)	delive	ry (cc)			Pre-st.	
End stop	1250	60	.9 -	- 62.9	540 - 560				4	Contro	01
	600	45	.8 -	- 50.8	0				0	x	
	750	59	.9 -	- 61.9	320 - 340				2	<u>A</u>	
	2100	52	.8 -	- 57.8	540 - 560				1	3	
	2650	20	.2 -	- 30.2	540 - 560	1			I	3	
	3050	be	low	5.0	540 - 560				17	f	
									L	2	1
Switch off	375		C	)	0						
Idle-	600	be	low	3.0	0						
stop	375	6	.0 -	10.0	0						
			· · · ·								
2-5	Cut-in volt	age max	x.:8	V							
Solenoid	Test voltag	je: 12 ·	- 14	V							

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ZEXEL - Test specifications Injection pumps

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Að	Injection pumps	

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					1/2
BOSCH	No.		94	60 610	361
ZEXEL	No.	ن. 	1.04	740-36	53
Date:	<u></u>		31.	01.199	2 [2]
Compa	ny:		MIT	SUBISH	I
No.			MD1	03208	
t pres	sure ]	in	e:		
80 750	017				
r pres	ssure		Diff	erence	e in
(mmHg)			deli	very	(cc)
- 560					
- 560					÷
- 560				4.5	
- 340					
0				2.0	
0					
- 560				5.5	
- 560					
			·	······································	
- •					
. Dii	nens	ic	ns		
	3.2	-	3.4	mm	1
F	5.7	-	5.9	mm	
IS	0.9	-	1.1	mm	
CS	3.6	-	3.8	mm	1
re-st.				mm	
ontro	leve	r a	angle	•	
	55°	- (	53°	deg	
	10.9	- :	16.0	mm	
	38°	- 4	48°	deg	
	12.1		15.6	mm	
		-		deg	
				mm	
					1

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1. Adjustment

1) Fix the control lever in the position satisfying the following conditions:

Boost Pressure:	540 - 560	mmHg
Pump Speed :	1250	rpm
Fuel Injection Quantity:	49.8 - 50.8	cc/1000st

2) With the control lever positioned as described in 1) above, adjust the governor sleeve so that the Timer Stroke conforms to the specified values (1 - 7).

2. Confirmation of Timer Characteristics

Fix the control lever in the position satisfying the following conditions, and confirm the Timer Stroke.

Control	lever position	Specified values		
Pump speed (rpm)	Fuel injection quantity (cc/1000st)	Boost pressure (mmHg)	Timer stroke (mn.)	Timer stroke reduction value (mm)
1250	49.3 - 51.3	540 - 560	(3.1)	0.2 - 1.0
1250	38.7 - 41.7	540 - 560	(2.3)	0.8 - 2.0

- 1. After adjusting full Q of 1250 rpm, set the boost pressure, at 750 rpm, at 330 mmHg or 0.45 kg/cm<sup>2</sup>, and adjust Q using the BCS spring's set screw.
- 2. Adjust the timing device stroke at a boost pressure of 550 mmHg or 0.75 kg/cm<sup>2</sup> by moving the control lever to the full Q position.

**ZEXEL** - Test specifications Injection pumps



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Injection pumps



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Test oil	2	ZEXEL - T	EST VA	LUES							1/3
ISO 4113 or	<b>U</b>	Di	stributor	r pumps				BOSCH	I No.	9 460 610 3	96
SAE J967d		En	gine mode	el: 4D56				ZEXEL	No.	104740-3673	
						-		Date:		31.01.1992	[0]
								Compa	iny:	MITSUBISHI	
Injection pump no.: 10464	10-3373	(N	P-VE4/10E	2100RNP460)				No.		MD106444	
Pump rot.: Clockwise-view	ved from drive	side Te	st-nozzle	e holder combi	nation:		T	est pres	sure 1	ine:	
		1	688 901 0	000			1	680 750	017		
1 Setting values		P	. Speed	Setti	ng values	1	Charge-	air pre	ssure	Difference :	.n
1. Secting values			(rpm)				ba	r (mmHg)		delivery (co	:)
1-1 Timing device travel			1250	3.5 - 3.9 (1	mm)						
1-2 Supply pump pressure			1250	4.5 - 5.1 (	kg/cm <sup>2</sup> )				1		
1-3 Full load delivery			1250	45.3 - 46.3 (	cc/1000st)					3.0	
Full load delivery		l		(	cc/1000st)						
1-4 Idle speed regulation	n		375	6.5 - 9.5 (	cc/1000st)					2.0	
1-5 Start			100	63.0 - 83.0 (	cc/1000st)						
1-6 Full-load speed regul	lation	1	2550	15.1 - 21.1 (	cc/1000st)					4.0	
1-7 Load-timer adjustment	٤		1250	T-0.4-0.8 (1	mm)						
2. Test values			- <u>-</u>	-1							
2-1 Timing device	N = rpm	500	750	1250	2100						
· · · · · · · · · · · · · · · · · · ·	mm	0.6-1.8	1.4-2.6	3.3-4.1	6.6-7.8		ł				
2-2 Supply pump	N = rpm		600	1250	2100			3. Di	mensi	lons	
	kg/cm <sup>2</sup>		2.9-3.5	4.5-5.1	6.5-7.1						
2-3 Overflow delivery	N = rpm	1250						K	3.2 -	- 3.4 mm	
	cc/10s	48.0-92.0		_ <u>L</u>		L		KF	5.7 -	- 5.9 mm	
2-4 Fuel injection quanti	ties			· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·			MS	1.1 -	- 1.3 mm	
Speed control lever pos.	P. Speed	Fuel o	delivery	Charge-air	Differe	ence in	l l	BCS	-	mm	
	(rpm)	(cc/:	L000st)	pres(mmHg)	deliver	ry (cc)		Pre-st.	-	mm	
End stop	1250	44.8	- 46.8					Contro	l lever	angle	
	600	42.3	- 45.3					α	55°-	63° deg	
e	2100	37.2	- 41.2					A	10.5 -	- 16.0 mm	
	2550	13.1	- 23.1					β	41°-	51° deg	
	2900	. belo	ow 5.0					В	12.5 -	16.5 mm	
								γ	- 1	deg	
						· · · ·		С	-	mm	
Switch off	375		0								
		·									4
Idle-	600	below	3.0								
stop	375	6.0	- 10.0					100			
· · · · · · · · · · · · · · · · · · ·						,					
2-5	Cut-in volt	tage max.:	8V								
Solenoid	Test voltag	ge: 12 - 1	.4V	·						·	
<b>ZEXEL</b> - Test specification	ons				TO ZEX	EL - Te	est spec	ification	S		

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ZEXEL - Test sp Injection pumps



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Injection pumps

1. Adjustment

1) Fix the control lever in the position satisfying the following conditions:

Boost Pressure:	-	mmHg		
Pump Speed :	1250	rpm		
Fuel Injection Quantity:	$35.7 \pm 0.5$	cc/1000st		

2) With the control lever positioned as described in 1) above, adjust the governor sleeve so that the Timer Stroke conforms to the specified values (1-7).

2. Confirmation of Timer Characteristics

Fix the control lever in the position satisfying the following conditions, and confirm the Timer Stroke.

Control	lever position	Specified values		
Pump speed (rpm)	Fuel injection quantity (cc/1000st)	Boost pressure (mmHg)	Timer stroke (mm)	Timer stroke reduction value (mm)
1250	34.7 - 36.7	-	(3.1)	0.2 - 1.0
1250	26.7 - 29.7 °	-	(2.3)	0.8 - 2.0

ZEXEL - Test specifications

Injection pumps



A14 ZEXEL - Test specifications Injection pumps





Figure 1

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- 1 = Bracket
- 2 = M-FICD lever
- 3 = Control lever

FICD MOUNTING POSITION ADJUSTMENT

**ZEXEL - Test specifications** 

Injection pumps

- 1. Hold the control lever in the idling position.
- Position the FICD mounting bracket so that the gap between the control lever and the FICD lever is 1 + 1 mm.

Test oil	ZEXE	TE	ST VA	LUES				1/:
ISO 4113 or		Dis	tributor	pumps			BOSCH No.	9 460 610 397
SAE J967d		Eng	ine mode	1: 4D56			ZEXEL No.	104740-3683
							Date:	31.01.1992 [2
							Company:	MITSUBISHI
Injection pump no.: 10464	40-3383	(NP	-VE4/10F	2100RNP461)			No.	MD106426
Pump rot.: Clockwise-view	wed from drive side	e Tes	t-nozzle	holder combi	nation:		Test pressure	line:
		16	88 901 0	00			1 680 750 017	
1 Setting values		Ρ.	Speed	Setti	ng values	Ch	arge-air pressure	Difference in
1. Petting values		(	(rpm)				bar (mmHg)	delivery (cc)
1-1   Timing device travel			1250	3.5 - 3.9 (	mm)			
1-2 Supply pump pressure			1250	4.5 - 5.1 (	$kg/cm^2$ )			
1-3 Full load delivery			1250	45.3 - 46.3 (	cc/1000st)			3.0
Full load delivery				(	cc/1000st)			·
1-4 Idle speed regulatio	n		375	6.5 - 9.5 (	cc/1000st)			2.0
1-5 Start			100 0	63.0 - 83.0 (	cc/1000st)	C.		
1-6 Full-load speed regu	lation		2550 :	15.1 - 21.1 (	cc/1000st)			4.0
1-7 Load-timer adjustmen	t		1250 5	<b>I-0.4-0.8</b> (1	mm)			
2. Test values				->				
2-1 Timing device	N = rpm	500	750	1250	2100			
	mm 0.0	5-1.8	1.4-2.6	3.3-4.1	6.6-7.8			
2-2 Supply pump	N = rpm		600	1250	2100		3. Dimens	ions
	kg/cm <sup>2</sup>	•	2.9-3.5	4.5-5.1	6.5-7.1			
2-3 Overflow delivery	N = rpm			1250				- 3.4 mm
	cc/10s			48.0-92.0			KF 5.7	- 5.9 mm
2-4 Fuel injection quanti	ties						MS 1.1	- 1.3 mm
Speed control lever pos.	P. Speed	Fuel de	elivery	Charge-air	Differe	nce in	BCS	- mm
	(rpm)	(cc/10	000st)	pres(mmHq)	deliver	v (cc)	Pre-st.	- mm
End stop	1250	44.8 -	- 46.8				Control leve	r angle
	600	42.3 -	- 46.3				a 190	- 27° dea
	2100	37.2 -	- 41.2				A 10.9	$-160 \mathrm{mm}$
	2550	14.6 -	21.6				B 360	- 46° deg
	2900	below	v 5.0					- 15 0 mm
								- deg
								- ueg
Switch off	375	C	)				1	
Idle-	600	below	3.0		1			
stop	375	6.0 -	10.0					
				<u> </u>			4	
2-5 Selencid	Cut-in voltage	max.:8	V					
sorenora	Trest voltage: 1	2 - 14	: V	· · · · · · · · · · · · · · · · · · ·				

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ZEXEL - Test specifications Injection pumps

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ZEXEL - Test specifications A 17 Injection pumps

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104740-3683 2/2

1. Adjustment

1) Fix the control lever in the position satisfying the following conditions:

Boost	t Pressure	:	-	mmHg
Pump	Speed	:	1250	rpm
Fuel	Injection	Quantity:	34.7 - 36.7	cc/1000st

2) With the control lever positioned as described in 1) above, adjust the governor sleeve so that the Timer Stroke conforms to the specified values (1-7).

2. Confirmation of Timer Characteristics

Fix the control lever in the position satisfying the following conditions, and confirm the Timer Stroke.

Control	l lever position	Specified values				
Pump speed (rpm)	Fuel injection quantity (cc/1000st)	Boost pressure (mmHg)	Timer stroke (mm)	Timer stroke reduction value (mm)		
1250	34.7 - 36.7	-	3.1	0.2 - 1.0		
1250	26.7 - 29.7	-	2.3	0.8 - 2.0		

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ZEXEL - Test specifications

Injection pumps

A19 ZEXEL - Test specifications Injection pumps



Test oil		ZEXEL - T	EST VA	LUES				· · · · · · · · · · · · · · · · · · ·
ISO 4113 or		D	istributor	pumps			BOSCH No.	9 460 610 398
SAE J967d		Eı	ngine mode	l: 4D56			ZEXEL No.	104740-3693
							Date:	31.01.1992 [2]
							Company:	MITSUBISHI
Injection pump no.: 1046	540-3383	(1	NP-VE4/10F	2100RNP461)			No.	MD109319
Pump rot.: Clockwise-vie	ewed from drive	side Te	est-nozzle	holder combine	nation:		Test pressure	line:
_	;;;;;	1	688 901 0	00			1 680 750 017	
1. Setting values		P	P. Speed	Setti	ng values	Ch	arge-air pressure	Difference in
			(rpm)				bar (mmHg)	delivery (cc)
1-1 Timing device trave	1		1250	3.5 - 3.9 (n	nm)			
1-2 Supply pump pressur	e		1250	4.5 - 5.1 ()	$(g/cm^2)$			
1-3 Full load delivery		·	1250 4	15.3 - 46.3 (c	cc/1000st)			3.0
Full load delivery				(c	cc/1000st)			
1-4 Idle speed regulation	on		375	6.5 - 9.5 (c	cc/1000st)			2.0
1-5 Start			100 6	53.0 - 83.0 (c	cc/1000st)	4		
1-6 Full-load speed reg	ulation		2550 1	.5.1 - 21.1 (c	c/1000st)			4.0
1-7 Load-timer adjustme	nt		1250 7	<u>-0.4-0.8 (n</u>	nm)			
2. Test values		<u>`</u>			·			
2-1 Timing device	N = rpm	500	750	1250	2100			
	mm	0.6-1.8	1.4-2.6	3.3-4.1	6.6-7.8			
2-2 Supply pump	N = rpm		600	1250	2100		3. Dimen	sions
<u></u>	kg/cm <sup>2</sup>	<u> </u>	2.9-3.5	4.5-5.1	6.5-7.1			
2-3 Overflow delivery	N = rpm			1250			K 3.2	- 3.4 mm
	cc/10s			48.0-92.0			KF 5.7	- 5.9 mm
2-4 Fuel injection quant	ities		· ·				MS 1.1	- 1.3 mm
Speed control lever pos.	P. Speed	Fuel	delivery	Charge-air	Differe	ence in	BCS	- mm
	(rpm)	(cc/	1000st)	pres(mmHg)	deliver	y (cc)	Pre-st.	- mm
End stop	1250	44.8	- 46.8				Control lev	er angle
	600	42.3	- 46.3				α 19	°-27° deg
	2100	37.2	- 41.2				A 10.9	- 16.0 mm
	2550	14.6	- 21.6				β 36	°- 46° deg
	2900	bel	ow 5.0				B 11.4	- 15.0 mm
							v v	- deg
							l c	- mm
Switch off	375		0					
Idle-	600	belo	w 3.0		·	<del>,</del>	1	
stop	375	6.0	- 10.0			<u> </u>	4	
2-5	Cut-in volt	age max.	:8V	<u></u> _				
Solenoid	Test voltas	. 10 .						

A 20

ZEXEL - Test specifications

Injection pumps



A 21

ZEXEL - Test specifications Injection pumps

1. Adjustment

1) Fix the control lever in the position satisfying the following conditions:

Boost Pressure:	-	mmHg
Pump Speed :	1250	rpm
Fuel Injection Quantity:	34.7 - 36.7	cc/1000st

2) With the control lever positioned as described in 1) above, adjust the governor sleeve so that the Timer Stroke conforms to the specified values (1-7).

2. Confirmation of Timer Characteristics

Fix the control lever in the position satisfying the following conditions, and confirm the Timer Stroke.

Contro	l lever position	Specified values			
Pump speed (rpm)	Fuel injection quantity (cc/1000st)	Boost pressure (mmHg)	Timer stroke (mm)	Timer stroke reduction value (mm)	
1250	34.7 - 36.7	-	3.1	0.2 - 1.0	
1250	26.7 - 29.7	-	2.3	0.8 - 2.0	

A 99	ZEXEL - Test specifications	A 02	ZEXEL - Test specifications
AZZ	Injection pumps	AZ3	Injection pumps



Test oil ISO 4113 or SAE J967d

ZEXEL - TEST VALUES Distributor pumps

Engine model: 4D56

Injection pump no.: 104640-3393 (NP-VE4/10F2100RNP462)									No.
Pump rot.: Clockwise-viewed from drive side Test-nozzle holder com						nation:		Т	'est pres
	<u> </u>		1 68	38 901 0	00			1	. 680 750
1. Setting values			₽.	Speed	Setti	ng values		Charge	-air pre
			(1	rpm)			bar (mmHg)		
1-1 Timing device travel			1	.250	3.5 - 3.9 (n	n <b>m)</b>		54	40 - 560
1-2 Supply pump pressure			1	.250	4.5 - 5.1 ()	$(g/cm^2)$		. 54	40 - 560
1-3 Full load delivery			1	.250	51.4 - 62.4 (c	c/1000st)		54	40 - 560
Full load delivery				750	50.4 - 61.4 (c	c/1000st)		32	20 - 340
1-4 Idle speed regulation	1			375	6.5 - 9.5 (0	c/1000st)	1		0
1-5 Start				100 6	53.0 - 83.0 (c	c/1000st)			0
1-6 Full-load speed regul	lation		2	650 2	22.2 - 28.2 (c	c/1000st)		54	10 - 560
1-7 Load-timer adjustment			1	250	<u>r-0.4-0.8</u> (n	um)		54	10 - 560
2. Test values	T					·····			
2-1 Timing device	N = rpm	500		750	1250	2100			
	mm	0.6-1.	.8	1.4-2.6	3.3-4.1	6.6-7.8			<b></b>
2-2 Supply pump	N = rpm			600	1250	2100			3. Di
	kg/cm <sup>2</sup>			2.9-3.5	4.5-5.1	6.5-7.1			
2-3 Overflow delivery	N = rpm				1250				ĸ
	cc/10s				48.0-92.0				KF
2-4 Fuel injection quanti	ties								MS
Speed control lever pos.	P. Speed	Fuel	L de	livery	Charge-air	Differe	ence in		BCS
	(rpm)	(cc	2/10	00st)	pres(mmHg)	deliver	cy (cc)		Pre-st.
End stop	1250	60.	.9 -	62.9	540 - 560				Contro
	600	45.	.8 -	50.8	0				α
	750	59.	.9 -	61.9	320 - 340				A
	2100	52.	.8 -	57.8	540 - 560				β
	2650	20.	2 -	30.2	540 - 560				В
	3050	bel	.ow	5.0	540 - 560				γ
									C
Switch off	. 375		0		.0				
Idle-	600	bel	.ow	3.0	0		<del></del>		
stop	375	6.	0 -	10.0	0				
2-5	Cut-in volt	age max	. : 81	1					
Solenoid	Test voltag	Test voltage: 12 - 14V							

A 24

ZEXEL - Test specifications Injection pumps



ZEXEL - Test specifications A 25 Injection pumps

					1/2
BOSCH	No.		94	60 610	522
ZEXEL	No.		104	740-371	.3
Date:			31.	01.1992	[0]
Compa	ny:		MIT	SUBISHI	
No.			MD1	06428	
t pres	sure 1	li	ne:		
30 750	017				
r pres	ssure		Diff	erence	in
(mmHg)		L	deli	very (c	cc)
- 560					
- 560					
- 560				4.5	
- 340					
0				2.0	
0					
- 560				5.5	
- 560					
. Dii	nens	i	ons	÷ • • • • • • • • • • • • • • • • • • •	
	3.2	-	3.4	mm	
F	5.7	-	5.9	mm	
S	0.9	-	1.1	mm	
CS	3.6	-	3.8	mm	
re-st.		_		mm	
ontrol	l leve	r	angle	2	
	19°	-	27°	deg	
	10.9	_	16.0	mm	
	38°	-	48°	deg	
	12.1	_	15.6	mm	
		-		deg	
		_		mm	

1. Adjustment

1) Fix the control lever in the position satisfying the following conditions:

Boost Pressure:	540 - 560	mmHg
Pump Speed :	1250	rpm
Fuel Injection Quantity:	49.8 - 50.8	cc/1000st

2) With the control lever positioned as described in 1) above, adjust the governor sleeve so that the Timer Stroke conforms to the specified values (1 - 7).

2. Confirmation of Timer Characteristics

Fix the control lever in the position satisfying the following conditions, and confirm the Timer Stroke.

Contro	l lever position	Specified values			
Pump speed (rpm)	Fuel injection quantity (cc/1000st)	Boost pressure (mmHg)	Timer stroke (mm)	Timer stroke reduction value (mm)	
1250	49.3 - 51.3	540 - 560	(3.1)	0.2 - 1.0	
1250	38.7 - 41.7	540 - 560	(2.3)	0.8 - 2.0	

- 1. After adjusting full Q of 1250 rpm, set the boost pressure, at 750 rpm, at 330 mmHg or 0.45 kg/cm<sup>2</sup>, and adjust Q using the BCS spring's set screw.
- 2. Adjust the timing device stroke at a boost pressure of 550 mmHg or 0.75 kg/cm<sup>2</sup> by moving the control lever to the full Q position.





Test oil		ZEXEL - T	EST VA	LUES						1/3
ISO 4113 or *		Di	stributo	r pumps				BOSCH	H NO.	9 460 610 384
SAE J967d		Er	ngine mode	el: 4D56				ZEXEI	NO.	104740-3743
								Date		31.01.1992 [0]
								Compa	iny:	MITSUBISHI
Injection pump no.: 10464	0-3333	(1)	IP-VE4/101	F2100RNP433)				No.		MD112513
Pump rot.: Clockwise-view	ed from drive	side Te	st-nozzle	e holder combi	ination:		Т	est pres	ssure 1	ine:
		1_	688 901 0	000			1	680 750	017	
1. Setting values		P	. Speed	Sett	ing values		Charge-	-air pre	ssure	Difference in
			(rpm)				ba	r (mmHg)		delivery (cc)
1-1 Timing device travel			1250	3.5 - 3.9 (	mm)					
1-2 Supply pump pressure			1250	4.5 - 5.1 (	kg/cm <sup>2</sup> )					
1-3 Full load delivery			1250	45.3 - 46.3 (	cc/1000st)					3.0
Full load delivery				(	cc/1000st)					
1-4 Idle speed regulation	<b>n</b> .		375	6.5 - 9.5 (	cc/1000st)					2.0
1-5 Start			100	63.0 - 83.0 (	cc/1000st)					
1-6 Full-load speed regul	Lation	`	2550	15.1 - 21.1 (	cc/1000st)					4.0
1-7 Load-timer adjustment			1250	<u>T-0.4-0.8 (</u>	mm )					
2. Test values	1					T	<u> </u>			
2-1 Timing device	N = rpm	500	750	1250	2100					
	mm	0.6-1.8	1.4-2.6	3.3-4.1	6.6-7.8			<b></b>		
2-2 Supply pump	N = rpm		600	1250	2100			3. Di	mensi	lons
	kg/cm²		2.9-3.5	4.5-5.1	6.5-7.1					
2-3 Overflow delivery	N = rpm	1250						K	3.2 -	- 3.4 mm
2-4 Fuel injection month		48.0-92.0	<u></u>			L		KF	5.7 -	- 5.9 mm
2-4 Fuel Injection quanti	LIES Croad	Theal						MS	1.1 -	- 1.3 mm
speed control lever pos.	P. Speed	Fuel c	letivery	Charge-air	Differe	ence in		BCS		· mm
End stop	(100)			pres (mmHg)	dellver	ry (cc)		Pre-st.	<u> </u>	mm
End scop	1250	44.0	- 40.8					Contro	L Lever	angle
	2100	42.3	- 40.3					α	55°-	63° deg
	2100	37.2	- 41.2					A	10.5 -	- 16.0 mm
	2550	13.1 bolo	- 23.1					1p	41°-	51° deg
	2900	Derc	DW 5.0					В	12.5 -	16.5 mm
								Y		deg
Switch off	275		0					C		mm
	3/5		0							
Idle-	600	hole	, 20							
stop	375	Detow	- 10 0				·	1		
	515	0.0	- TO'O	·	<u> </u>					
2-5	Cut-in vol+		017		1					
Solenoid	Test volta	ay = max.:	417			÷				
	LICSC VOICAL	$\frac{1}{2}$ , $\frac{1}{2}$ - 1						<u> </u>		

**B2** 

**B**1

ZEXEL - Test specifications Injection pumps



ZEXEL - Test specifications Injection pumps

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- 1. Adjustment
  - 1) Fix the control lever in the position satisfying the following conditions:

Boost	Pressure	•		mmHg
Pump	Speed	:	1250	rpm
Fuel	Injectica.	Quantity:	35.7 ± 0.5	cc/1000st

- 2) With the control lever positioned as described in 1) above, adjust the governor sleeve so that the Timer Stroke conforms to the specified values.
- 2. Confirmation of Timer Characteristics

Fix the control lever in the position satisfying the following conditions, and confirm the Timer Stroke.

Control	lever position	Specified values			
Pump speed (rpm)	Fuel injection quantity (cc/1000st)	Boost pressure (mmHg)	Timer stroke (mm)	Timer stroke reduction value (mm)	
1250	34.7 - 36.7	-	(3.1)	0.2 - 1.0	
1250	26.7 - 29.7	-	(2.3)	0.8 - 2.0	

ZEXEL - Test specifications Injection pumps



**B4** ZEXEL - Test specifications Injection pumps





Figure 2

## 104740-3743 3/3

- 1 = Bracket
- 2 = M-FICD lever
- 3 = Control lever

FICD MOUNTING POSITION ADJUSTMENT

- 1. Hold the control lever in the idling position.
- Position the FICD mounting bracket so that the gap between the control lever and the FICD lever is 1 + 1 mm.

ZEXEL - Test specifications

Injection pumps



Test oil		ZEXEL - TE	ST VA	LUES						1/2
ISO 4113 or		Dis	stributo	r pumps				BOSCI	H No.	9 460 610 433
SAE J967d		Eng	gine mode	el: 4D56				ZEXE	L No.	104740-3910
								Date	:	31.01.1992 [0]
								Compa	any:	MITSUBISHI
Injection pump no.: 10464	0-3910	(NI	P-VE4/101	2100RNP823)				No.		MD155266
Pump rot.: Clockwise-view	ved from drive	side Tes	st-nozzle	e holder combi	nation:		T	est pres	ssure 1	ine:
		16	588 901 (	000			1	680 75	0 017	
1. Setting values		₽.	P. Speed Setting values (rpm)					air pre r (mmHg)	ssure	Difference in delivery (cc)
1-1 Timing device travel			1250	4.3 - 4.7 (r	nm)					
1-2 Supply pump pressure			1250	4.5 - 5.1 ()	(g/cm²)					
1-3 Full load delivery			1250	45.3 - 46.3 (0	cc/1000st)					3.0
Full load delivery				( (	cc/1000st)					
1-4 Idle speed regulation	n		375	8.5 - 11.5 (0	cc/1000st)					2.0
1-5 Start			100	63.0 - 83.0 (0	cc/1000st)					
1-6 Full-load speed regu		2550	15.1 - 21.1 (0	cc/1000st)					4.0	
1-7 Load-timer adjustment	<u>t</u>	L	1250	<b>T-0.4-0.8</b> (r	nm)					
2. Test values	· · · · · · · · · · · · · · · · · · ·		·····		T					
2-1 Timing device	N = rpm	500	750	1250	1750	2100	Î			
	mm	1.6-2.4	2.4-3.2	4.2-4.8	6.0-7.2	7.4-8.	2	·		
2-2 Supply pump	N = rpm		1250	1	2100			3. Di	mens:	ions
	kg/cm <sup>2</sup>		4.5-5.1		6.5-7.1		]			
2-3 Overflow delivery	N = rpm		1250					K	3.2 ·	- 3.4 mm
	cc/10s		48 - 92		L			KF	5.7 -	- 5.9 mm
2-4 Fuel injection quanti	ties							MS	1.1 -	- 1.3 mm
Speed control lever pos.	P. Speed	Fuel d	elivery	Charge-air	Differe	ence in		BCS		- mm
	(rpm)	<u>(cc/1</u>	000st)	pres(mmHg)	deliver	ry (cc)		Pre-st.		- mm
End stop	1250	44.8	- 46.8					Contro	<u>l lever</u>	angle
	600	42.3	- 46.3					α	19°-	- 27° deg
	1750	38.2	- 42.2					A	10.9 -	- 16.0 mm
	2100	37.1	- 41.3					β	36°-	- 46° deg
	2550	14.6	- 21.6					В	11.4 -	- 15.0 mm
	2900	below	5.0					γ	-	- deg
								С		- mm
Switch off	375		0							
			····							
Idle-	375	8.5	- 11.5					ł		
stop	600	below	5.0							
	750	below	3.0							
	1							1		

Cut-in voltage max.:8V Test voltage: 12 - 14V Solenoid

ZEXEL - Test specifications

**B**7 Injection pumps

ZEXEL - Test specifications

**B6**. Injection pumps

2-5



- 1. Adjustment
  - 1) Fix the control lever in the position satisfying the following conditions:

Boost Pressure:	-	mmHg
Pump Speed :	1250	rpm
Fuel Injection Ouantity:	35.0 - 36.0	cc/1000st

2) With the control lever positioned as described in 1) above, adjust the governor sleeve so that the Timer Stroke conforms to the specified values (1-7).

2. Confirmation of Timer Characteristics

Fix the control lever in the position satisfying the following conditions, and confirm the Timer Stroke.

Contro	l lever position	Specified values				
Pump speed (rpm)	Fuel injection quantity (cc/1000st)	Boost pressure (mmHg)	Timer stroke (mm)	Timer stroke reduction value (mm)		
1250	34.5 - 36.5	-	-	0.3 - 0.9		
1250	26.5 - 29.5	-	- ,	0.9 - 1.9		

ZEXEL - Test specifications Injection pumps - -

**B9** ZEXEL - Test specifications Injection pumps



Test ISO 4	oil 113 or	1	ZEXEL -	TEST VI Distributo	ALUES or pumps			ROCC	H NO	9 460 610 434
SAE J	1967d			Engine mod	lel: 4D56			7585	NO.	104740-2020
1								Data		
								Dale		31.U1.1992 [0] MITCIPICUT
Injec	tion pump no.: 1046	40-3910		(NP-VE4/10	F2100RNP823)			No	y	MDIEEDCE
Pump	rot.: Clockwise-view	wed from drive	side	Test-nozzl	e holder combi	nation	<u></u>	Tort and		ino.
				1 688 901	000				Soure 1 1 017	
1 1	attina meloce	<u> </u>		P. Speed	Setti	ng values	Ch	arge-air pre	SSUTA	Difference in
1. 50	etting values			(rpm)				bar (mmHg	Soure	delivery (cc)
1-1 7	Timing device travel	,		1250	4.3 - 4.7 (1	mm)		(minaly		
1-2 5	Supply pump pressure	•		1250	4.5 - 5.1 ()	kg/cm²)				
1-3 I	Full load delivery			1250	45.3 - 46.3 (	cc/1000st)				3 0
1	Full load delivery				()	cc/1000st)				~ • •
1-4 ]	Idle speed regulatio	n		375	8.5 - 11.5 (4	ec/1000st)				2.0
1-5 5	Start			100	63.0 - 83.0 (	cc/1000st)				_ • •
1-6 H	Full-load speed regu	lation		2550	15.1 - 21.1 (	cc/1000st)				4.0
1-7 I	Load-timer adjustmen	t		1250	T-0.4-0.8 (1	mm)				- • •
2. Te	est values	······································				64°				
2-1 T	'iming device	N = rpm	500	750	1250	1750	2100			
		mm	1.6-2.	4 2.4-3.	2 4.2-4.8	6.0-7.2	7.4-8.2			
2-2 S	upply pump	N = rpm		1250		2100		3. Di	mens	ions
	•	kg/cm <sup>2</sup>		4.5-5.	1	6.5-7.1				
2-3 0	verflow delivery	N = rpm.		1250				ĸ	3.2	- 3.4 mm
		cc/10s		48 - 92				KF	5.7	- 5.9 mm
2-4 F	uel injection quanti	lties						MS	1.1	- 1.3 mm
Speed	control lever pos.	P. Speed	Fuel	delivery	Charge-air	Difference in		BCS		- mm
		(rpm)	. (cc	/1000st)	pres(mmHg)	deliver	cy (cc)	Pre-st.		- mm
End s	top	1250	44.	8 - 46.8				Contro	l lever	r angle
		600	42.	3 - 46.3				α	19°.	- 27° deg
l		1750	38.	2 - 42.2				A	10.9	- 16.0 mm
		2100	37.	1 - 41.3				β	36°.	- 46° deg
		2550	14.	6 - 21.6				В	11.4 .	- 15.0 mm
		2900	bel	017 5.0	1			Y		deg
				- 2m2				c		mm
Switc	h off	375		Car?						
Idle-	<u></u>	375	8.	5 - 11.5		······		4		
stop		600	bel	ow 5.0						
		750	bel	ow 3.0						
								1		
2-5		Cut-in volt	age max	.:8V	······			1		
Solend	oid	Test voltag	re: 12 -	14V						

**B**10 Injection pumps

**B**11

Test specifications Injection pumps

1. Adjustment

1) Fix the control lever in the position satisfying the following conditions:

Boost	t Pressure	2:	-	minHg
Pump	Speed	:	1250	rpm
Fuel	Injection	Quantity:	35.0 - 36.0	cc/1000st

2) With the control lever positioned as described in 1) above, adjust the governor sleeve so that the Timer Stroke conforms to the specified values (1-7).

2. Confirmation of Timer Characteristics

Fix the control lever in the position satisfying the following conditions, and confirm the Timer Stroke.

Contro	l lever position	Specified values				
Pump speed (rpm)	Fuel injection quantity (cc/1000st)	Boost pressure (mmHg)	Timer stroke (mm)	Timer stroke reduction value (mm)		
1250	34.5 - 36.5	-	-	0.3 - 0.9		
1250	26.5 - 29.5	-		0.9 - 1.9		

**B12** 

ZEXEL - Test specifications

Injection pumps



B13 ZEXEL - Test specifications Injection pumps



Test oil:		ZE	EXEL - '	TEST V	ALUES					
ISO 4113 or			1	Distribut	ors pumps				BOSCH No.	9 460 610 279
SAE J967d			1	Engine mo	del: SD23			-	ZEXEL No.	104740-4301
								-	Date:	31.01.1992 (0
									Company:	NISSAN DIESEL
Injection pump no. 104640	-4261			(NP-VE4/1	0F2000RNP147)				No.	16700 R8310
Pump rot.: clockwise-view	ed from d	rive s	side 7	Test-nozz	le holder com	pination:		Test	pressure	line:
· · · · · · · · · · · · · · · · · · ·			]	L 688 901	000	· <u> </u>		1 68	0 750 017	
1. Setting values				P. Speed (rpm)	Sett	ing value	S	Charge-air bar (mmHg)	pressure	Difference in delivery (cc)
1-1 Timing device travel				1700	4.4 - 4.8	(mm)		<u>,</u>		
1-2 Supply pump pressure				1700	5.7 - 6,3	$(kq/cm^2)$				
1-3 Full load delivery				1000	35.6 - 36.6	(cc/1000st	:)			3.0
Full load delivery			1			(cc/1000st	:)			
1-4 Idle speed regulation	1			300	4.3 - 8.3	(cc/1000st	.)			2.0
1-5 Start				100	55.0 - 90.0	(cc/1000st	:)			
1-6 Full-load speed regul	lation			2300	10.6 - 14.6	(cc/1000st	:)			
1-7 Load-timer adjustment	:									
2. Test values									<u></u>	I
2-1 Timing device		N = r	rpm	1	000	1700	2000	The second se		
		Π	nm	1.5	- 2.7 4.3	- 4.9	5.2 - 6.	2		
2-2 Supply pump		N = r	rpm		600	1700	2000	3	. Dimension	18
		k	cg/cm <sup>2</sup>	3.2	<u>- 3.8 5.7</u>	- 6.3	6.5 - 7.	1		
2-3 Overflow delivery		N = r	rpm	1	000		K	3.2	- 3.4 mm	
		C	c/10s	8.0	- 52.0			K	F 5.7	- 5.9 mm
2-4 Fuel injection quanti	ties						· · · · · · · · · · · · · · · · · · ·	M	S 1.4	- 1.6 mm
Control lever position	P. Spe	eed	Fuel de	elivery	Charge-air	Diff	erence in	В	CS	- mm
	(rpm	)	(cc/100	00 stroke	s) pres(mmHg)	deli	very (cc)	P	e-st.	- mm
End stop	1000		35.1 -	37.1				C	ontrol leve	r angle
	600	<b>)</b>	29.3 -	33.3				α	219	- 29° deg
	2000	<b>)</b>	30.5 -	34.7				A	4.0	- 9.2 mm
	2300	ן כ	10.1 -	15.1		1		β	379	- 47° deg
	2450	>	below	5.0		1		В	10.7	- 14.8 mm
								Y		- deg
								<u>c</u>		- mm
Switch off	300	2	0							
Idle	300	P	4.3 -	8.3					•	
stop	350	<u>}</u>	below	3.0						
2-5	Cut-in	volta	ge max.	8 V	I	<u>L</u>				
Solonoid	The att	1 to a true	10							

**B14** 

ZEXEL - Test specifications Injection pumps



ZEXEL - Test specifications Injection pumps

B 15

Test oil:	:	ZEXEL -	TEST VA	LUES				1/2
ISO 4113 or			Distributo	r pumps			BOSCH No.	9 460 610 280
SAE J967d			Engine mod	el: SD23		ZEXEL NO.	104740-4641	
							Date:	31.01.1992 [1]
						-	Company:	NISSAN DIESEL
Injection pump no.: 10464	0-4631		(NP-VE4/10	F2150RNP329)			No.	16700 R8801
Pump rot.: Clockwise-view	ed from drive	side	Test-nozzl	e holder combi	nation:	Test	pressure	line:
			1 688 901	000		1 68	30 750 017	
1. Setting values			P. Speed (rpm)	Setti	ng values	Charge-air bar (mmHg)	r pressure	Difference in delivery (cc)
1-1 Time device travel			1000	1.5 - 1.9 (1	mm)		<u></u>	
1-2 Supply pump pressure			1000	3.9 - 4.5 (	$kg/cm^2$ )			
1-3 Full load delivery			1000	35.6 - 36.6 (	cc/1000st)			3.0
1-4 Idle speed regulation	1		300	4.3 - 8.3 (	cc/1000st)			2.0
1-5 Start			100	45.0 - 80.0 (	cc/1000st)			
1-6 Full-load speed regul	lation		2450	8.2 - 15.6 (	cc/1000st)			
1-7 ACS adjustment			1000	Decrease 5.0-	6.0 (cc/1000st)	-164	1 ± 5	
2. Test values								
2-1 Timing device	N = rpm		1000	1400	2150			
	mm	1	.4-2.0	2.6-3.8	5.6-6.8			
2-2 Supply pump	N = rpm		1000	1400	2150	3	. Dimens	sions
	kg/cm <sup>2</sup>	3	.9-4.5	4.9-5.5	6.8-7.4			
2-3 Overflow delivery	N = zpm		1000			K	3.2	- 3.4 mm
	cc/10s	41	0-85.0			K	F 5.65	- 5.85 mm
2-4 Fuel delivery quantit	ies	~~~				M	S 1.1	- 1.3 mm
Speed control lever pos.	P. Speed	Fue:	delivery	Charge-air	Difference in	B	cs	– mm
	(rpm)	(co	c/1000st)	pres(mmHg)	delivery (cc)	P	restr.	– mm
End stop	1000	35.1 -	37.1			С	ontrol leve	er angle
	1000	Decrea	se 4.5-6.5	-164 ± 5		α	210	- 29° deg
	600	30.3 -	34.3			A	4.0	- 9.2 mm
	2150	31.9 -	35.9			ß	41°	- 51° deg
	2450	8.1 -	16.1	ĺ		B	12.1	- 16.1 mm
	2600	below	5.0			Y		- deq
						Ċ		- mm
Switch off	300	0						
Idle-	300	4.3 -	8.3					
stop	350	below	3.0					
		1						
2-5	Cut-in volt	age max	.: 8V		<u></u>			
Solenoid	Test voltag	ge: 12 -	14V					

**B16** 

ZEXEL - Test specifications Injection pumps



ZEXEL - Test specifications

Injection pumps

**B17** 

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A = Adjustment limit

B = Inspection limit

### Figure 3

a = Altitude

- b = Atmospheric pressure
- c = Injection quantity decrease (cc/1000st)

FULL-LOAD FUEL INJECTION QUANTITY AND ACS ADJUSTING PROCEDURE AT HIGH ALTITUDES

- 1. FULL-LOAD FUEL INJECTION QUANTITY ADJUSTMENT
  - 1) Remove the ACS cover, the bellows and the adjusting shims.
  - 2) Perform all adjustments as described in the adjusting specifications, except for ACS adjustment.
- 2. ACS ADJUSTMENT
  - 1) Attach the ACS cover, the bellows and the adjusting shims.
  - 2) At a pump speed of 1000 rpm and refering to the graph above, use the shims to adjust the fuel injection quantity decrease according to the altitude.



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DIA	Injection pumps	

104740-4641 2/2

B

Test oil:		ZE	EXEL -	TES	TVA	LUES						
ISO 4113 or			1	Dist	ributor	s pump	)S				BOSCH No.	9 460 610 281
SAE J967d			, <b>1</b>	Engin	ne mode	1: SD2	:3				ZEXEL No.	104740-4650
											Date:	31.01.1992 [0]
											Company:	NISSAN DIESEL
Injection pump no.: 104640	0-4620			(NP-1	VE4/10F	2150RN	IP328)	- · · · · · · · · · · · · · · · · · · ·			No.	16700 R8802
Pump rot.: Clockwise-viewe	ed from d	rive s	side 1	Test-	-nozzle	holde	er comb	ination:		Tes	t pressure	line:
			1	1 688	<u>8 901 0</u>	00				1 6	80 750 017	
1. Setting values				P. S	Speed		Sett	ing valu	es	Charge-ai	r pressure	Difference in
				(r)	pm)					bar (mmHg	)	delivery (cc)
1-1 Timing device travel				10	000	1.5 -	1.9	(mm)				
1-2 Supply pump pressure				10	000	4.0 -	4.6	(kg/cm <sup>2</sup> )				
1-3 Full load delivery				10	100 3	35.6 -	36.6	(cc/1000s	st)			3.0
Full load delivery			1	-				(cc/1000s	st)			
1-4 Idle speed regulation				د ،		4.3 -	8.3	(cc/1000s	st)			2.0
1-6 Full-load speed regul	ation			1 24	50 4	15.U ~	30.0	(CC/1000s	5C)			
1-7 Load-timer adjustment	acion			24	50	0.0 -	15.6	(CC/10005	(C)			
1-8					1							
2. Test values												
2-1 Timing device		N = r			100	0	1	400	2150			
		m	uu 200		1.4 -	2.0	26	- 3 8	56.56	o 1		
2-2 Supply pump		N = r			100	0	1	400	2150		Dimonsio	
		k	car/cm <sup>2</sup>		4.0 -	4.6	50	- 5.6	6 9 - 7		. Dimensio	08
2-3 Overflow delivery		N = r	::::::::::::::::::::::::::::::::::::::		100	0	- 2.0	5.0	0.0 - 7.			2 4
		c	cc/10s 8.0 - 5		52.0	2.0			F 5 65	- 3.4 mm		
2-4 Fuel injection quantit	ies									N		- 1.05 mm
Control lever position	P. Spe	eed 1	Fuel de	elive	erv	Char	ge-air	Dif	ference in			- <u> </u>
	(rpm	)	(cc/100	00 st	trokes)	pres	(mmHq)	del	iverv (cc)		me-st 0 18	- 0.22 mm
End stop	1000	0	35.1 -	37.1	L						ontrol leve	er angle
	600	<b>b</b> .  :	30.3 -	34.3	3						21	$^{\circ}$ - 29° deg
	2150	o  :	31.9 -	35.9	Ð	1					4.0	- 9.2 mm
	2450	5	8.1 -	16.1	L					ß	41	°- 51° deg
	2600		below	5.0	)					B	12.1	- 16.1 mm
												- dea
											2	- mm
Switch off	300		0									
Idle	300		4.3 -	8.3	3							
stop	350	2	below	3.0	)							
2-5	Cut-in	voltag	ge max.	. 8V								
Solenoid	Test vo	ltage	: 12 -	14V								

**B 20** 

ZEXEL - Test specifications Injection pumps



ZEXEL - Test specifications **B 21** Injection pumps



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80	) 7	75
.r	pı	ce
<b>J</b> )		
54	±	5

Т			1	40	0					21	5
										•	
D	ec	re	eas	se	5.0	0-6	.0	(cc	:/1	000	S
1	в.	6	-	15	. 6	(C	c/1	.000	)st)	)	
4	5.	0	-	80	0.0	(c	c/1	.000	)st)	)	
· ۱	¥ •	5	-	0		10		.000	JSL,	/	

-	16	4 :	± 5	
				•

Test oil:	Z	EXEL - TEST VA	LUES				1/2
ISO 4113 or		Distributo	or pumps			BOSCH No.	9 460 610 282
SAE J957d		Engine mod	lel: SD23			ZEXEL No.	104740-4660
						Date:	31.01.1992 [1]
						Company:	NISSAN DIESEL
Injection pump no.: 10464	0-4640	(NP-VE4/10	)F2150RNP330)			No.	16700 R8803
Pump rot.: Clockwise-view	ed from drive	side Test-nozzl	e holder combin	ation:	Te	st pressure	line:
2 ang 2 a tra		1 688 901	000		1	680 750 017	
	P. Speed	Settir	ng values	Charge-a	ir pressure	Difference in	
1. Setting values		(rpm)			bar (mmH	Ig)	delivery (cc)
1-1 Time device travel		1000	1.5 - 1.9 (m	m)			
1-2 Supply pump pressure		1000	4.0 - 4.6 (k	g/cm <sup>2</sup> )			
1-3 Full load delivery		1000	35.6 - 36.6 (c	c/1000st)			3.0
Full load delivery			(c	c/1000st)			
1-4 Idle speed regulation	1	300	4.3 - 8.3 (c	c/1000st)			20
1-5 Start		100	45.0 - 80.0 (c	c/1000st)			
1-6 Full-load speed regul	lation	2450	2450 8.6 - 15.6 (cc/1000st)				
1-7 ACS adjustment	-7 ACS adjustment 1000 Decrease 5.0-6.0			.0 (cc/1000st)	-1	L64 ± 5	
2. Test values							
2-1 Timing device	N = rpm	1000	1400	2150			
	mm	1.4 - 2.0	2.6 - 3.8	5.6 - 6.8		<b></b>	
2-2 Supply pump	N = rpm	1000	1400	<b>2150</b>		3. Dimens	ions
	kg/cm <sup>2</sup>	4.0 - 4.6	5.0 - 5.6	6.8 - 7.4			
2-3 Overflow delivery	N = rpm	1000				K 3.2	- 3.4 mm
	cc/10s	8.0 - 52.0	- 52.0			KF 5.65	- 5.85 mm
2-4 Fuel delivery quantit:	ies					MS 1.1	- 1.3 mm
Speed control lever pos.	P. Speed	Fuel delivery	Charge-air	Difference in	n	BCS	– mm
	(rpm)	(cc/1000st)	pres(mmHg)	delivery (cc)	)	Prestr. 0.18	- 0.22 mm
End stop	1000	35.1 - 37.1		·		Control leve	er anglê
	600	30.3 - 34.3				α 21°	- 29° deg
	1000 ·	Decrease 4.5-6.	5 -164 $\pm$ 5			A 4.0	- 9.2 mm
	2150	31.9 - 35.9				β 41°	- 51° deg
	2450	8.1 - 16.1				B 12.1	- 16.1 mm
	2600	below 5.0				γ	- deg
						С	- mm
Switch off	300	0					
Idle-	300	4.3 - 8.3					
stop	350	below 3.0	,				
		<u> </u>					
2-5	Cut-in volt	age max.: 8V					
Solenoid	Test voltag	ge: 12 - 14V					

ZEXEL - Test specifications B 22 Injection pumps

ZEXEL - Test specifications

Injection pumps

**B23** 

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(m)

A = Adjustment limit

B = Inspection limit

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Figure 4

- a = Altitude
- b = Atmospheric pressure
- c = Injection quantity decrease (cc/1000st)

FULL-LOAD FUEL INJECTION QUANTITY AND ACS ADJUSTING PROCEDURE AT HIGH ALTITUDES

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Б	24

ZEXEL - Test specifications Injection pumps



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D ZJ	Injection	numr	5

104740-4660, 2/2



- 1. FULL-LOAD FUEL INJECTION QUANTITY ADJUSTMENT
  - 1) Remove the ACS cover, the bellows and the adjusting shims.
  - Perform all adjustments as described in the adjusting specifications, except for ACS adjustment.
- 2. ACS ADJUSTMENT
  - 1) Attach the ACS cover, the bellows and the adjusting shims.
  - 2) At a pump speed of 1000 rpm and referring to the graph above, use the shims to adjust the fuel injection quantity decrease according to the altitude.



**ZEXEL - Test specifications** 

Injection pumps



Test oil ISO 4113 or SAE J967d

## ZEXEL - TEST VALUES Distributor pumps Engine model: TD27-T

Injection pump no.: 104640-7113 (NP-VE4/10F2050RNP750)										No.		
Pump rot .: Clockwise view	ed from drive	side	Test-nozzle holder combination:							Te	st pre	ss
			16	1 688 901 000						1 (	580 75	0
1 Setting values			P.	P. Speed . Settings				Charge-air pres			ss	
1. Detting varues			(	rpm)	*	) S/T = Solen	oid Timer		bar	(mmHg	g)	
1-1 Timing device travel			1	1100	*	) S/T ON 4.0	- 4.8 (mm)			410	- 430	D
						OFF 2.1	- 2.5 (mm)			410	- 430	C
1-2 Supply pump pressure			1	L100	S	/T ON 5.6 -	6.4 (kg/cm <sup>2</sup>	2)		410	- 430	C
						OFF 4.0 -	$4.6 (kg/cm^2)$	2)		410	- 430	С
1-3 Full load delivery				L100	6	1.8 - 62.8 (c	c/1000st)			410	- 430	С
Full load delivery				850	5	8.4 - 59.4 (c	c/1000st)			240	- 260	Э
1-4 Idle speed regulation	L			375		6.4 - 10.4 (c	c/1000st)				0	
1-5 Start				100	4	5.0 - 80.0 (c	c/1000st)				0	
1-6 Full-load speed regul	ation		2	2250	4	0.8 - 44.8 (c	c/1000st)			410	- 430	)
2.Test values							·	•				
	Solenoid timer		ON	I			OFF				•	
2-1 Timing device	N = rpm	110	0			1100	1700	2500				
	mm	3.9-4	9		-+	2.0-2.6	5 4.2-5.2		.4	ſ		
2-2 Supply pump	N = rpm	110	0	1700		1100	1700			· · •	<u>3. Di</u>	<u>. m</u>
	kg/cm <sup>2</sup>	5.6-6	.4	7.4-8.	2	4.0-4.6	5.8-6.4	L				
2-3 Overflow delivery	N = rpm	110	0		1100 without O-ring						K	
		43.0-8	7.0			60.0-103.0		· · · · · · · · · · · · · · · · · · ·			KF	
2-4 Fuel injection quantit	ties	<u> </u>									MS	ł
Speed control lever pos.	P. Speed	Fue	l de	livery		Charge-air Differe		ence in			BCS	
	(rpm)	(0	c/10	00st)		pres(mmHg)	deliver	ry (cc)		ļ	Prestr.	Ţ
End stop	1100	61		63.3		410 - 430				ļ	Contro	升
	1100	47	.0 -	52.0		0					α	
	850	57	.9 -	59.9		240 - 260					A	
	2000	50	- 8 -	55.8		410 - 430					β	
	2150	47	.5 -	53.5		410 - 430					B	
	2250	40	.3 -	45.3		410 - 430					γ	
	2500	11	.9 -	20.9		410 - 430				Ļ	C	
	2700	b	elow	3.0		410 - 430						
Switch off	375		0	)		0						
Idle-	370	6	.4 -	10.4		0						
stop	450	b b	elow	1 5.0		0	fa · · · · = ·=· ·					
2-5	Cut-in volt	cage ma	x.:	8V .								
Solenoid	Test voltag	je: 12	- 14	<b>V</b>		•					<u> </u>	

ZEXEL - Test specifications

C1

Injection pumps



ZEXEL - Test specifications

C 2

Injection pumps

			•		1/2
BOSCH	No.		94	60 610	519
ZEXEL	No.		104	740-71	.13
Date:			31.	01.199	2 [0]
Compa	ny:		NIS	SAN DI	ESEL
No.			167	00 80G	07
t pres	sure 1	.iı	ne:		
80 750	017	<b></b>			
r pres	sure		Diff	erence	e in
)	· · · ·		deli	very	(cc)
- 430					
- 430					
- 430	-				
- 430	,			3 0	
- 260				5.0	
0				2.0	
0					
- 430					
. Dii	nens	i	ons		
	3.2	-	3.7	mm	
	5.7	-	5.9	mm	
	0.8	-	T.0	mm	
metro '	3.4	_	2.0	mm	
ontrol	leve	r	angle		
	60		140	dea	
	4.0	_	9.2	mm	
	310	_	41°	dea	
	8.8	_	12.8	mm	
				deq	
8		-		mm	
					1

- If there is no designation in the specifications for the Solenoid Timer's ON OFF position, then the position should be regarded as OFF.
- When confirming timing device travel and supply pump pressure characteristics, apply boost pressure of 410 - 430 mmHg to the boost chamber.

### POTENTIOMETER ADJUSTMENT

ZEXEL - Test specifications

Injection pumps

**C**3

Under the following conditions, alter the potentiometer's installation position so that the out-put voltage equals the specified value.

Adjı -	istment Condit:	ions	Specified Value			
Control lever position	Pump speed (rpm)	Fuel injection quantity (cc/1000st)	Out-put voltage (V)	Remarks		
Measure	750	17.8 ± 1.0	$4.0 \pm 0.03$	Adjust. point		
Idle	-	-	-	Check point		
Full speed	-	-	,	Check point		

(In-put voltage: 10V)

**C4** 

Injection pumps



Test Oil		ZEXEL -	TEST VA	ALUES						BOSCI	H No.	9 460	61
ISO 4113 or			Distribute	or pumps						ZEXE	L No.	104740	-8
SAE J967d			Engine moo	1e1: 4D56						Date	:	31.01.	19
										Compa	any:	MITSUB	IS
Injection pump no.: 1046	40-8360		(NP-VE4/10	0F2100RNP1	.022)					No.		MD1786	26
Pump rot.: Clockwise-vie	wed from drive	e side	Test-nozzi	le holder	combin	atio	n:		Te	est pres	ssure :	line:	
· · · · · · · · · · · · · · · · · · ·			1 688 901	022			7		1	<u>680 750</u>	0 073		
1. Setting values			P. speed		Sectin	ig va	iues		harge a	air pres	ssure	Differenc	e
1-1 Timing device travel	·		1000	35-3	9 (mm	1	·····		Dal		<u> </u>	delivery	(0
1-2 Supply pump pressure			1000	3.9 -	4.5 (k)	/ a.cm	2)		54	0 - 560			
1-3 Full load delivery			2000 (FULL)	62.6 - 6	3.6 (c)	c/100	)0st)		54	0 - 560 0 - 560		<u>Б</u>	ö
Full load delivery		1	750 (BCS)	61.4 - 6	2.4 (c)	c/100	00st)		32	0 - 340			Ŭ
1-4 Idle speed regulation	n		375	10.9 - 1	3.9 (c	c/100	) 0st)			0		2.	0
1-5 Start			100	67.0 - 8	7.0 (c	c/100	00st)			0			
1-6 Full-load speed regu	lation		* <b>1</b> 2650	24.9 - 3	0.9 (c	c/100	)0st)			0		5.	5
1-7 Load-timer adjustmen	t		1000	T-0.5-0.	9 (m	m)			54	0 - 560			_
2. Test values													-
	Charge air			540	0 - 560	0 mmH	Ig						
2 1 Triming dowigo	pres. mmHg	500	1 2000 1	1050	150/	1	2000	1 0100					
2-1 fiming device		0 7-2 3	3 4-4 0	1250	5 1-6	,  .	2000	2100	_				
2-2 Supply pump	N = rpm	0.7 2.3	1000	4.1-3.3	1500	<del>; -  </del> -	/.2-0.3	2100	<u> </u>	3 01	<b>m</b> o <b>n</b> a	iane	
	$kq/cm^2$		3.9-4.5		5.1-5	.7		6.5-7	1	3. 01	Mens	10118	
2-3 Overflow delivery	N = rpm		1000			<u> </u>			-	к	3.2	- 3.4 mm	
• •	cc/10s	4	8.0-92.0							KF	5.7	- 5.9 mm	
2-4 Fuel injection quant:	lties									MS	0.6	- 0.8 mm	
Speed control lever pos.	Pump speed	i Fue	l delivery	Charge	-air	Ι	Differen	nce in		BCS		- mm	
	(rpm)	(00	c/1000st)	pres (m	mHg)	ć	lelivery	r (cc)	· · · · ·	Pre-st.		- mm	
End stop	2000 (FULL)	62.	.1 - 64.1	540 -	560					Contro	l Leve	r Angle	
	750 (BCS)	60	.9 - 62.9	320 -	340					α	55°	- 63° Ang	jlę
	600	44	.0 - 49.0	0						A	8.3	- 14.8 mm	
	1250	66.	.2 - 71.2	540 -	560					β	37°	- 47° Ang	jle
	2100	60.	.5 - 63.5	540 -	560					B	11.7	- 15.3 mm	
	2650	24	.4 - 31.4	540 -	560					γ		- Ang	le
Switch off	275	<u>D</u> e	210W 5.U	540 -	560						1	<u> </u>	
Idle_stop	750												
TATE-SCOP	600	be	=10W = 0	0									
	375	10	4 - 14 4	0									
Partial load	*2 750	33	7 - 36.7	0			••••						
2-5	Cut-in vol	tage max	c.: 8V		<u>l</u>								
Solenoid	Test volta	ge: 12 -	- 14V	•									
				1	1							Į.	
ZEALL - Lest specificat	ions				ſ	6	ZEXE	. – Те	st spec	ification	าร		
Injection number						UI							



- 1. Adjustment
  - 1) Fix the control lever in the position satisfying the following conditions:

Boost	t Pressure	9:	540-560	mmHg
Pump	Speed	• •	1000	rpm
Fuel	Injection	Quantity:	47.5 - 48.5	cc/1000st

- 2) With the control lever positioned as described in 1) above, adjust the governor sleeve so that the Timer Stroke conforms to the specified values (1-7).
- 2. Confirmation of Timer Characteristics

Fix the control lever in the position satisfying the following conditions, and confirm the Timer Stroke.

Control	lever position	Specified values			
Pump speed (rpm)	Fuel injection quantity (cc/1000st)	Boost pressure (mmHg)	Timer stroke (mm)	Timer stroke reduction value (mm)	
1000	47.0 - 49.0	540 - 560	-	0.4 - 1.0	
1000	36.5 - 39.5	540 - 560	-	1.2 - 2.4	

Note:

- For items marked \*, confirmation is as follows:
- 1. Insert the shims (1.0 mm thick) between the control lever and the full-speed stopper bol~.
- 2. Confirm the fuel injection quantity at the specified pump speed.



ZEXEL - Test specifications Injection pumps



C8 ZEXEL - Test specifications Injection pumps



### POTENTIOMETER ADJUSTMENT SPECIFICATIONS

Adju	stment Condit	ions	Specified Value	
Control lever position	Pump speed (rpm)	Fuel injection quantity (cc/1000st)	Out-put voltage (V)	Remarks
Measure	750	5 ± 0.03	35.2 ± 1	Adjust. point
Idle	-	above 1	-	Check point
Full speed	-	(8.6)	-	Check point

(In-put voltage: 10V)

- 1. At a pump speed of 750 rpm, hold the control lever in a position where a fuel injection quantity of  $35.2 \pm 1 \text{ mm}^3/\text{st}$  can be obtained.
- 2. Screw in the adjusting screw until it contacts the control lever and fix it using the locknut.
- 3. Adjust the potentiometer so that the output voltage is 5.0  $\pm$  0.03 V.
- 4. Following adjustment, remove the adjusting screw, hold the control lever in the idle position, and confirm that the potentiometer voltage is as described above.



C10 ZEXEL - Test specifications Injection pumps



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-			_	_	-		

Test oil		ZEXEL - T	EST VA	LUES				1/2
ISO 4113 or		D:	istributo	r pumps			BOSCH No.	9 460 610 325
SAE J967d		E	ngine mode	el: TD27			ZEXEL No.	104740-9562
							Date:	31.01.1992 [0]
							Company:	NISSAN DIESEL
Injection pump no.: 10464	10-9562	(1	NP-VE4/101	F2150RNP558)			No.	16700 43G13
Pump rot.: Clockwise-view	wed from drive	e side Te	est-nozzle	e holder combi	nation:		Test pressure	line:
		1	688 901 (	000			1 680 750 017	
1. Setting values		P.	. speed (rpm)	Setti	ng values	Charge	e-air pressure ar (mmHq)	Difference in delivery (cc)
1-1 Timing device travel			1700	4.7 - 5.1 (1	mm)			
1-2 Supply pump pressure			1700	5.6 - 6.2 ()	kg/cm²)			
1-3 Full load delivery			1100	51.8 - 52.8 (	cc/1000st)			3.0
Full load delivery				- ((	cc/1000st)			
1-4 Idle speed regulation	n	l.	350	5.3 - 9.3 (0	cc/1000st)			2.0
1-5 Start			100	45.0 - 80.0 (0	cc/1000st)			
1-6 Full-load speed regu	lation		2350	31.0 - 35.0 (0	cc/1600st)			
		l						
2. Test values				- <u></u>				
2-1 Timing device	N = rpm	1100	1700		2550			
	mm	2.3-2.	9 4.4-5.4		6.8-7.8			
2-2 Supply pump	N = rpm	1100	1700	2150		1	3. Dimens	ions
	kg/cm <sup>2</sup>	4.1-4.	7 5.6-6.2	6.6-7.2				
2-3 Overnow delivery	N = rpm	12 0 07					K 3.2	- 3.4 mm
2-4 Eucl injection guanti		43.0-87.	0	<u></u>			KF 5.7	- 5.9 mm
2-4 Fuel injection quanti	Dimp speed	The all					MS 0.8	- 1.0 mm
speed concror rever pos.	rump speed	ruer (cc/	lelivery	Charge-air	Difference	in	BCS	- mm
End stop	1100	<u> </u>		pres (mmHg)	delivery (	<u>cc)</u>	Pre-st.	<u> </u>
Ind Scop	<u> </u>	51.3					Control leve	r angle
	2150	40.8	- 34.8				α 35.5°	- 43.5°deg
	2350	30.5	- 45.0				Ya 24.3	- 28.7 mm
	2550	50.5	- 35.5					- 41° deg
	2700	5.0 hal	- ±-±.0				в 9.3	- 12.9 mm
	2709		J.U			ļ	γ C	- deg - ma
Switch off	350		0					
Idle-	350	5.3	- 9.3	····				
stop	450	bela	DW 3.0					
Partial load			······			·····		
2-5	Cut-in volt	tage max.:	8V					
Solenoid	Test voltad	ge: 12 - 1	.4V			I		

C 11

ZEXEL - Test specifications Injection pumps

ZEXEL C 12 Injection pumps

-	T	e	S	t	S	p	ec	;i	fi	C	a	ti	Q	n	S
							_								



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Figure 5

a = End face of flange
b = Hole "A"

CONTROL LEVER ANGLE MEASUREMENT POSITION

1. Measure the control lever angles ( $\alpha$ ,  $\beta$ ,  $\gamma$ ) at hole "A".





E	30	S	CH
_	_		_
	727	57	77

BOGCH	No		9.4	60 610	1/2
ZEVEL	No.		7 4	740-950	341
Date	NO.		21	01 1000	[1]
Compa			MTC	CAN DTE	
No	<u>11 y :</u>		167	SAN DIE	<u>с</u>
110.	<u>auro</u> 1		10/	00 43G1	.0
ton 750	old I	. 1 11	e:		
r proc	CUTO		Diff	orongo	
,)	sure		doli	voru (	
	noid		uerr	very (	201
= SUIEI	DIG				
CTINE	-				
				3 0	
				2.0	
				2.0	
3. Di:	nens	io	ns		
K	3.2	-	3.4	mm	·
KF	5.7	-	5.9	mm	
MS	0.8	-	1.0	mm	
BCS		-		mm	
Pre-str		-		mm	
Control	l leve:	ra	ngle	2	
α	51.5°	- 5	59.59	'deg	
Ya	24.3	- 2	28.7	mm	
β	31°	- 4	110	deg	
В	9.3	- 1	12.9	mm	
γ		-		deg	
C		-		mm	
					]

Test	oil		ZEXEL -	TEST V	ALUES				Dogger		
150 4	4113 OL			Discribute	or pumps			•	BOSCH N	0.	9 460 610
SAE	196 (a			Endine woo	HET: THE			•	ZEXEL N	0.	104740-959
1									Date:		31.01.1992
									Company	·•	NISSAN DIES
Injec	ction pump no.: 10464	0-9592		(NP-VE4/10	)F2150RNP561)	•			No.		16700 43G16
Pump	rot.: Clockwise view	ed from drive	side	1 688 901	000	ination:		Test	z pressu 30 750 0	re line 17	:
				P. speed	Sett	ing values	Cł	narge-ain	pressu	relI	Difference
1.5	etting values		1	(rpm)		J	ba	ar (mmHg)		d	delivery (c
1-1	Timing device travel			1100	S/T ON 3.9 -	4.7 (mm)		*) S/T =	Solenoi	id	
					OFF 2.4 -	2.8 (mm)			timer		
1-2	Supply pump pressure			1100	S/T ON 4.5 -	• 5.3 (kg/cr	n²)				
					OFF 3.5 -	4.1 (kg/cr	n²)				
1-3	Full load delivery			1100	51.8 -	52.8 (cc/10	000st)				3.0
	Full load delivery					(cc/10	000st)				
1-4	Idle speed regulation	ı		350	5.3 -	9.3 (cc/10	000st)				2.0
1-5	Start			100	45.0 -	80.0 (cc/10	000st)			e.	
1-6	Full-load speed regul	lation		2350	31.0 -	35.0 (cc/10	000st)				
1-7											
2.T	est values	Solonoid timor		01	<u> </u>	0.55		<u> </u>			
<b>.</b>	Diming doviso		1100		1100		0000				
∠-⊥ 1	LIMING GEATCE		3 8-4	8	2 3-2 0		6 9-7 0				
2-2 0			1100	1700	1100	1700	2150	- 5	Dimo	nete	n a
<u>6</u> -6 2	arbra hamb	$k \sigma / cm^2$	4 5-5	3 5 9-6	7 3 5-4 1	4 9-5 5	5 8-6 4		<u>• • • • • • •</u>		
2-2 0	werflow delivery	$N = rnm^{-1}$	1100	<u> </u>	1100 wit	hout $0$ -ring	1 3.0-0.4			2 2 - <sup>-</sup>	3 1 mm
<i>2</i> - J (	CITTOM RETIACTÀ	cc/10s	43.0-87		60 0-10	3.0		v v		5.7 - 1	5.9 mm
2-4 F	Tuel injection quanti	ties	10.0 07		00.0 10	5.0			IS I		
Speed	control lever pos.	P. speed	Fuel	deliverv	Charge-air	Differe	ence in		CS	-	mm
22000	actor hope	(rpm)	(cc	:/1000st)	pres (mmHa)	deliver	cv (cc)	Þ	re-str	-	mm
End s	stop	1100	51.	3 - 53.3	(inneg/				ontrol 1	lever at	ngle
	E	600	50.	8 - 54.8					5	1.50_ 50	9.5°dea
		2150	40.	8 - 45.0				v	a 24	1.3 - 21	8.7 mm
		2350	30	5 - 35.5				R	- 4	310- 41	1º dea
		2550	5	6 - 14.6						9.3 - 12	- ucy 2.9 mm
		2700	hel	OW 5.0							nan 212
		2,00				1				-	mm
Switc	ch off	350		0		1		$\dashv$ $\vdash$			
Idle-	-	350	5.	3 - 9.3		1	<u> </u>	-			
stop		450	bel	.ow 3.0							
2-5		Cut-in vol	tage max	.: 8V	<b>4</b>		<u></u>	-1			
Soler	noid	Test volta	ge: 12 -	14V							
					, <b>p</b>						
ZEX	EL - lest specificati	ons					EL - Tes	t specifi	cations		
Inie	ction pumps			_		JIJ Inie	ction pun	nos			




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a = End face of flange b = Hole "A"

Control lever angle measurement position

1. Measure the control lever angles ( $\alpha$ ,  $\beta$ ,  $\gamma$ ) at hole A.



Test oil:		ZEXE	L - TE	ST VA	LUES						1/2
ISO 4113 or			Dis	stributo	r pumps	3				BOSCH No.	9 460 610 518
SAE J967d			Eng	jine mod	el: 4JB	1CGT				ZEXEL No.	104741-1691
										Date:	31.01.1992 [0]
										Company:	ISUZU
Injection pump no.: 10464	1-1243		(NI	P-VE4/11	F1900LN	P549)				No.	8944528231
Pump rot.: Counter clockw	ise-viewe	d from	Tes	st-nozzlo	e holde	r combi	.nation:		Test	pressure	line:
	driv	e side	16	88 901	000				1 68	30 750 017	
1. Setting values			P.	Speed		Setti	.ng valu	es	Charge-ai	r pressure	Difference in
				(rpm)					bar (mmHg)		delivery (cc)
1-1 Timing device travel				1600	4.8 -	5.2	(mm)		590	- 610	
1-2 Supply pump pressure				1600	4.8 -	5.2	$(kg/cm^2)$		590	- 610	
1-3 Full load delivery			125	0 FULL	60.8 -	61.8	(cc/1000)	)st)	590	- 610	3.5
Full load delivery			125	0 BCS	48.9 -	49.9	(cc/1000	)st)	340	- 360	4.5
1-4 Idle speed regulation	1			375	5.0 -	9.0	(cc/1000	)st)		0	2.0
1-5 Start			*	100	60.0 -	100.0	(cc/1000	)st)		0	(Idle)
1-6 Full-load speed regul	lation			2300	13.6 -	19.6	(cc/1000	)st)	590	- 610	4.5
			<u> </u>	<u></u>							L
2. Test values		* Move	contro	1 lever	to idle	e posit	lon, the	en adjustme	ent .		
2-1 Timing device		N = rpn	n		00	10	800				
		mm		4.7 -	- 5.3	5.8	- 6.6				
2-2 Supply pump		N = rpn	n (	16	00		800		3	. Dimens	lions
		kg/	Cm <sup>2</sup>	4.8 -	- 5.2	5.3	- 5.9				
2-3 Overflow delivery		N = rpn		16	00				R	2.7	- 2.9 mm
	1	CC/	103	45.0 -	- 88.0				K	F 5.4	- 5.6 mm
2-4 Fuel injection quantit	ties								M	S 0.8	- 1.0 mm
Control lever position	Pump s	peed	Fuel d	elivery	Char	ge-air	Dit	ference in	E	CS 4.7	- 4.9 mm
	(rpr	n)	(CC/1	000st)	pres	(mmHg)	dei	ivery (cc)		re-str. 0.83	- 0.87 mm
End stop	1250 (F		60.3	- 62.3	590	- 610			4	ontrol leve	er angle
	1250 (B	cs)	48.4	- 50.4	340	- 360			0	14	e-22e deg
	60	0	32.0	- 40.0	90	- 110			A	2.5	- 7.6 mm
	75	0	35.9	- 42.9	170	- 190			4	32	•- 42° deg
	90	0	46.0	- 53.0	340	- 360				8.7	- 12.6 mm
	180	0	55.1	- 62.1	590	- 610			γ		- deg
	230	U	13.1	- 20.1	590	- 610	- e				- mm
	260	0	belo	w 5.0	590	- 610					
Switch off	37	5		0		0					
Idle	37	5	5.0	- 9.0		0					
stop	50	0	belo	w 3.0		0					
2-5	Cut-in	voltage	max. (	3 V			•				
Solenoid	Test vo	oltage:	12 - 14	4 V							

**C 17** 

ZEXEL - Test specifications Injection pumps



C 18	ZEXEL -	Test	specificatio
	Injection	pump	S

ons

Note:

After adjustment of full load fuel injection quantity (1250 rpm, 60.8 - 61.8 cc/1000st), set the boost pressure at 340 - 360 mmHg or (- kg/cm<sup>2</sup>), and at a pump speed of 1250 rpm adjust the fuel injection quantity using the BCS spring set screw.

When confirming timing device travel, overflow delivery and supply pump pressure characteristics apply boost pressure of 590 - 610 mmHg to the boost chamber.

Attach the timer's measuring device to the low pressure side.



**ZEXEL - Test specifications** 

Injection pumps



Test oil:	1	ZEXEL - TE	ST VA	LUE	S						1/
ISO 4113 or		Di	stributor	r pun	nps				BOSCH	I No.	9 460 610 394
SAE J967d		En	gine mode	4JB1CDT			ZEXEL	NO.	104741-1754		
									Date:		31.01.1992 [0]
									Compa	iny:	ISUZU
Injection pump no : 10464	11-1744	(N	P-VE4/11F	F1900	ORNP578)				No.		8944751626
Pump rct.: Clockwise-view	ved from drive	side Te	st-nozzle	e hol	lder combin	nation:		Te	est pres	sure 1	line:
		1	688 901 0	000				1	680 750	017	
1. Test values		P	. Speed		Setti	ng values		Charge-	air pre	ssure	Difference in
			(rpm)					bar	(mmHg)		delivery (cc)
1-1 Timing device travel			1700	5.0	- 5.4 (n	nm)		59	0 - 610		
1-2 Supply pump pressure			1700	5.2	- 5.6 (k	$(g/cm^2)$	1	59	0 - 610		
1-3 Full load delivery			1250	63.2	- 64.2 (c	c/1000st)		59	0 - 610		3.5
Full load delivery	•		900	50.9	- 51.9 (c	c/1000st)		34	0 - 360		4.5
1-4 Idle speed regulation	n		385	3.1	- 7.1 (c	c/1000st)			0		2.0
1-5 Start	7 a h à am		100	60.0	- 100.0(6	c/1000st)			0		
1-6 Full-load speed regu	Lation	<u>.</u>	2300	19.3	- 25.4 (0	C/1000SC)		59	0 - 610		4.5
2. Test values	Solonoid timor	017	1			077					
o t Mining Jossico	Solenoid unier	- UN			1450	1700	1050				
2-1 fiming device		350 2500			1450	1/00	1850	_			
2-2 Supply pump		500	500		1/50	1700	1950	· <sup>2</sup>	2		1
z-z subbit bamb	$k = 1 p m^2$	40-60	above 6		13-19	52-56	1050		3. 01	mens	1048
2-3 Overflow delivery		3.0 - 0.0	1700		4.5 - 4.5	5.2 - 5.8	5.0 ~ 0	. 2	T		- 2.0 mm
2-3 OVEILIOW delivery	cc/10s		73 - 1	50					KE	5 7	
2-4 Fuel injection quanti	ties								MS	0.8	- 1 0 mm
Speed control lever pos.	Pump Speed	Fuel d	leliverv	1 Cł	arge-air	Differe	ence in		BCS	4.4	- 4.6 mm
	(rpm)	(cc/1	1000st)	DI	res(mmHq)	delive	rv (cc)		Prestr.		- mm
End stop	1250	62.7	- 64.7	5	90 - 610				Contro	l leve	r angle
	600	33.1	- <b>41</b> .1		90 - 110				α	140	- 22° deg
	750	38.7	- 42.7	1	70 - 180				A	11.3	- 14.7 mm
	900	50.4	- 52.4	3	40 - 360				β	32°	- 42° deg
	1800	54.6	- 61.6	5	90 - 610				В	10.1	- 13.6 mm
	2300	18.8	- 25.8	5	90 - 610				γ	1	- deg
	2500	belo	w 5.0	5	90 - 610				c		- mm
Switch off	385		0		0				1		
Idle	385	3.1	- 7.1		0						
stop	500	belo	w 3.0		0		<u> </u>		1		
2-5	Cut-in volt	age max.:	8 V								
Solenoid	Test voltag	je: 12 -	14 V								

**C 20** 

Injection pumps



ZEXEL - Test specifications C 21

Injection pumps



After adjustment of full load fuel injection quantity (1250 rpm, 63.2 - 64.2 cc/1000st), set the boost pressure at 340 - 360 mmHg or (- kg/cm<sup>2</sup>), and at a pump speed of 900 rpm adjust the fuel injection quantity using the BCS spring set screw.

If there is no designation in the specifications for the Solenoid Timer's ON-OFF position, then the position should be regarded as OFF.

When confirming timing device travel and supply pump pressure characteristics and overflow delivery, apply boost pressure of 590 - 610 mmHg to the boost chamber.

Attach the timer's measuring device to the low pressure side.



Figure 7

Figure 8

1 = Micro-switch fixing bolt

MICROSWITCH ADJUSTMENT

- 1. Fix the control lever in a position where the gap between the control lever and the idling stopper bolt is  $6.0 \pm 0.4$  mm (control lever angle:  $10^{\circ}$   $15^{\circ}$ ).
- 2. Adjust the microswitch mounting position so that the microswitch turns OFF.

V-FICD ADJUSTMENT

- 1. Adjust the bracket so that the clearance S is 1+1 mm.
- 2. Apply 400 mmHg negative pressure to the inside of the actuator and confirm that the actuator shaft moves the full stroke.

1 Control lever (idle position)



C 22

ZEXEL - Test specifications

Injection pumps.



0.00	ZEXEL - Test specifications	
623	Injection pumps	

#### Note:

**C24** 

Test oil:	Z	EXEL -	TEST VA	LUES					1/2
ISO 4113 or	·		Distributo	or pumps				BOSCH No.	9 460 610 377
SAE J967d			Engine mod	le1: 4JA1				ZEXEL NO.	104741-6631
								Date:	31.01.1992 [0]
			4 <b>1</b>					Company:	ISUZU
Injection pump no.: 10464	1-6631		(NP-VE4/11	F1900RNP856)	<u></u>			No.	8943820511
Pump rot.: Clockwise-view	ed from drive	side	Test-nozzl	e holder comb:	ination:		Tes	t pressure	line:
			1 688 901	000		<u> </u>	16	80 750 017	
1. Setting values			P. Speed	Sett:	ing values	C	harge-ai ar (mmHg	r pressure	Difference in delivery (CC)
1-1 Time device travel		C	1600	5.3 - 5.7	(mm)		at (mindig	1	
1-2 Supply pump pressure			1600	4.8 - 5.2	$(k\alpha/cm^2)$				
1-3 Full load delivery			1150	43.8 - 44.8	(cc/1000st)				3.5
Full load delivery					(cc/1000st)				
1-4 Idle speed regulation			385	4.0 - 8.0	(cc/1000st)				2.0
1-5 Start				60.0 - 100.0	(cc/1000st)				
1-6 Full-load speed regul	Lation		2400	13.1 - 19.1	(cc/1000st)				4.5
2. Test values		· · · · · · · · · · · · · · · · · · ·		L					1
	Solenoid timer		ON		OFF	_			
2-1 Timing device	N = rpm		670	1000	1600	2000			
	mm	ał	pove_0.5	0.6 - 1.4	5.2 - 5.8	7.4 - 8.	2		
2-2 Supply pump	N = rpm				1600	2000		3. Dimens	ions
	kg/cm <sup>2</sup>				4.8 - 5.2	5.9 - 6.	5		
2-3 Overflow delivery	N = rpm		1600		1600			K 2.7	- 2.9 mm
	cc/10s	62.	0 - 105.0	67 - 110		KF 4.9 - 5.1 mm			
2-4 Fuel delivery quantit	ies		······································				I	4S 0.9	- 1.1 mm
Speed control lever pos.	Pump Speed	Fue	el delivery	Charge-air	Differe	ence in	1	BCS	- mm
	(rpm)	· (c	cc/1000st)	pres(mmHg)	deliver	ry (cc)	[1	Prestr. 0.43	- 0.47 mm
End stop	1150	43	3.3 - 45.3				(	Control leve	er angle
	500	26	5.0 - 33.0					x 14°	- 22° deg
	700	31	L.9 - 36.9				2	A 11.3	- 14.7 mm
	1150	43	3.3 - 45.3					329	- 42° deg
	2400	12	2.6 - 19.6				I	3 10.2	- 13.6 mm
	2500	Ŀ	pelow 12.0				1 5	,	- deg
								2	mm
Switch off	385		0			<i></i>			
Idle-	500	h	pelow 30	·····	1		-		
stop	385		.0 - 8.0						
2-5	Cut-in volt	age ma	x.: 8 V						
Solenoid	Test voltage	e: 12	- 14 V						
				**** <b>*</b> *******************************					······································

**ZEXEL** - Test specifications Injection pumps



C 25

**ZEXEL** - Test specifications

Injection pumps



### 104741-6631 2/2

- 1 = Control lever (Idling position)
- V-FICD ADJUSTMENT
  - 1. Adjust the bracket so that the clearance S is  $1^{+1}$  mm.
  - 2. Apply 400 mmHg negative pressure to the inside of the actuator and confirm that the actuator shaft moves the full stroke.





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- Z.	ЕΧ	EL	
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Test oil: ISO 4113 or	2	ZEXEL -	TEST VA Distributo	LUES or pumps				BOSCH No.	1/2 9 460 610 378
SAE J967d			Engine mod	lel: 4JA1				ZEXEL NO.	104741-6641
								Date:	31.01.1992 [0]
								Company:	ISUZU
Injection pump no.: 10464	1-6631		(NP-VE4/11	F1900RNP856)				No.	8943820521
Pump rot.: Clockwise-view	ed from drive	side	Test-nozzl	e holder comb	ination:		Те	st pressure	line:
			1 688 901	000			1	680 750 017	
1. Setting values			P. Speed (rpm)	Sett	ing values		Charge-a	ir pressure	Difference in
1-1 Time device travel			1600	5.3 - 5.7	(mm)			9/	derivery (cc)
1-2 Supply pump pressure			1600	4.8 - 5.2	$(kq/cm^2)$				
1-3 Full load delivery	1-3 Full load delivery			43.8 - 44.8	(cc/1000st)				3 5
Full load delivery					(cc/1000st)				5.5
1-4 Idle speed regulation	<b>1</b>		385	4.0 - 8.0	(cc/1000st)				2.0
1-5 Start			100	60.0 - 100.0	(cc/1000st)				
1-6 Full-load speed regul	lation		2400	13.1 - 19.1	(cc/1000st)				4.5
2. Test values	•				· · · · · ·	I	<u>.</u>	·	
	Solenoid timer		ON		OFF		·		· · · · · · · · · · · · · · · · · · ·
2-1 Timing device	N = rpm		670	1000	1600	2000			
	mm	ał	pove 0.5	0.6 - 1.4	5.2 - 5.8	7.4 - 8	.2		
2-2 Supply pump	N = rpm				1600	2000		3. Dimen	sions
	kg/cm <sup>2</sup>				4.8 - 5.2	5.9 - 6	.5		
2-3 Overflow delivery	N = rpm		1600		1600			K 2.7	- 2.9 mm
	cc/10s	62.	0 - 105.0	»	67 - 110			KF 4.9	- 5.1 mm
2-4 Fuel delivery quantit	ies	·			· · · · · · · · · · · · · · · · · · ·			MS 0.9	- 1.1 mm
Speed control lever pos.	Pump Speed	Fue	el delivery	Charge-air	Differe	ence in		BCS	– mm
	(rpm)	(c	c/1000st)	pres(mmHg)	deliver	cy (cc)		Prestr. 0.43	- 0.47 mm
End stop	1150	43	.3 - 45.3					Control lev	er angle
	500	26	.0 - 33.0					α 14	°-22° deg
	700	31	9 - 36.9					A 11.3	- 14.7 mm
	1150	43	.3 - 45.3					β 32	°-42° deg
	2400	12	.6 - 19.6					B 10.2	- 13.6 mm
_	2500	b	elow 12.0					γ	- deg
								C	- mm
Switch off	385		0			<u> </u>			
Idle-	500	b	elow 3.0		T				
stop	385	4	.0 - 8.0		· · · · · · · · · · · · · · · · · · ·				
2-5	Cut-in volt	age ma	x.: 8 V						
Solenoid	Test voltage	e: 12	- 14 V						

D 2

D 1

ZEXEL - Test specifications Injection pumps

ZEXEL - Test specifications Injection pumps



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# 104741-6641 2/2

- 1 = Control lever
  (Idling position)
  - V-FICD ADJUSTMENT
    - 1. Adjust the bracket so that the clearance S is  $1^{+1}$  mm.
    - 2. Apply 400 mmHg negative pressure to the inside of the actuator and confirm that the actuator shaft moves the full stroke.



Test oil: ISO 4113 or SAE J967d

ZEXEL - TEST VALUES Distributor pumps Engine model: S2

Injection numbers 104649	00F2			/ \\T		10100730	22.2.0.				-	Compa	31
Injection pump no.: 104648-	10052		6 mar	(141	-VE4/8F	2125LN	2138)					No.	
Pump rotation: Counter cloc	KW1Se-VJ	lewed	lirom	res	SC-NOZZI		er combi	nation:			Test	pre	55
		ILIVE	side	T 0	000001	000	0.11				1 68	0 75	2
1. Setting values				Ρ.	Speed		Setti	ng valu	es	Char	rge-air	pre	5.5
					(rpm)					bar	(mmHg)		_
1-1 Timing device travel					1250	4.0 -	4.4 (1	mm)					
1-2 Supply pump pressure					1250	4.4 -	5.0 (.	$kg/cm^2$ )					
1-3 Full load delivery					1250	38.5 -	39.5 (	cc/1000s	st)	1		•	
Full load delivery					205		()	CC/1000s	st)				
1-4 Idle speed regulation			į		325	5.2 -	9.2 (	CC/1000s	st)				
1-5 Start					100	apove	4.0 (	CC/1000s	st)				
1-6 Full-load speed regulat	.101				2400	13.1 -	17.1 (	CC/1000s	st)				
1-7 Load-timer adjustment													
2. Test values													
2-1 Timing device		N -	rom		12	50	21	25					_
		<b>*•</b> -	mm	İ	3 9	- 45	85	- 9 7					
2-2 Supply nump		N -			5.5	00	1	<u> </u>	2125		5	Dire	_
		•• -	ka/cm²		21.	- 27		- 5 0	6 9 - 7		12	. Din	Ť
2-3 Overflow delivery		N -	rom		12	50	3.2	- 5.0	0.9 - 7.	- <u>-</u>	77		ĺ
			cc/10s		52 0	- 95 A					K		
2-4 Fuel injection quantitie	l		00/100		52.0	- 55.0							
Control lever position	Pump gr	heed	Fuel		VATU	Char	go_air	Dif	· forman in		M		
control acter position	(rom	)	fuel (cc/1)	76TT	strokes		ye-all		interence in		B	.5	
End stop	1250		20	000	AO O	/ pres	s (mining)	dei	Ivery (cc)	<u> </u>	PI	e-st.	Ţ
	500		30	.u -	- 40.0							ontro	÷
	2125		32	.0.	- 30.0						α		İ
	2125		10	. 2 -	- 37.2						A		╀
	2400		12	·1 -	- 18.1					1	β		
	2500	,	מ	etow	v 10.0						В		4
			-								Y		
Switch off	325				0						F		-
Idle	325		5	.2 -	9.2								
stop	below	470		0	)								
				-			<u></u>						
2-5	Cut-in	volta	age max	ĸ. 8	v			<u> </u>					
Solenoid	Test vo	ltag	a. 12 .	- 14	37								

**D4** 

ZEXEL - Test specifications Injection pumps



ZEXEL - Test specifications

Injection pumps

D 5

					1/3						
BOSCH	I No.		94	60 610	401						
ZEXEL	NO.		104	748-005	2						
Date:			31.	01.1992	[0]						
Compa	ny:		MAZ	DA							
No.			S20	1138000							
t pressure line:											
80 750	017										
r pres	sure	ľ	Difference in								
)		_	deli	very (c	c)						
•				3.0							
				о F							
				4.5							
				4.0							
			_								
		_									
. Dim	ension	8	•								
			•								
		-	3.4	mm							
	5./	-	5.9	mm							
	1.1	•	1.9	mm							
no-ct		_		mm							
ontro		- r	angle								
Unitro.	210		290	dea							
	2.5	_	7.7	mm							
	450	_	55°	dea							
	12.8	-	16.8	mm							
		-		deq	÷						
		-		mm							



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#### 1. Fixing the M-CSD Stopper

- 1) Fix the M-CSD assembly temporarily to the pump housing.
- 2) Turn the drive shaft at least two turns in the direction of pump rotation.
- 3) Turn the drive shaft slowly, and fix the drive shaft in a position where a load is applied (the point where the roller in the roller holder contacts the cam surface of the cam disc).
- 4) Move the CSD lever to the advance side.
- 5) Fix the CSD lever in the position where the ball pin at the tip of the shaft lightly contacts the roller holder (roller holder advance angle "0").
- 6) Adjust the adjusting screw so that the gap "a" between the CSD lever and the stopper is 0.5+2 mm.
- 7) After adjustment, tighten the M-CSD screw to the specified torque (T).

T = 0.6 - 0.9 kpm

### 2. Fixing the CSD Lever Plate

- 1) Fix the CSD lever in a position where the gap "a" between the CSD lever and the stopper is 0 mm.
- 2) Adjust the plate position so that the gap "b" between the intermediate lever roller and the CSD lever plate is 0.5 mm. After adjustment, fix the plate in this position with the two screws.

D	6	

Injection pumps



Figure 11

1 = Adjusting screw 2 = Roller holder 3 = FICD Screw 4 = Intermediate lever 5 = Plate

6 = Stopper

7 = CSD Lever

Injection pumps

**D7** 

**ZEXEL** - Test specifications



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# 104748-0052 3/3

# 3. FICD Screw Adjustment

- 1) Move the CSD lever so that it contacts the stopper.
- 2) Insert a block gauge (thickness gauge) of 11.5 ± 1 mm thickness between the control lever and the idling stopper bolt. (To position the control lever 13° from the idling position)
  - 3) Adjust the FICD screw so that the control lever and the FICD screw are in contact.

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**ZEXEL** - Test specifications



Injection pumps

BOSCI	
ZEXE	

Date	:

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	$\mathbf{n}$	m	n	-

Tes	t oil:		ZEXEL - I	EST VAL	UES				1/4
ISO	4113 or		I	Distributor	pumps			BOSCH No.	9 460 610 402
SAE	J967d		F	Engine mode	1: RF			ZEXEL NO.	104748-0346
								Date:	31.01.1992 [0]
								Company:	MAZDA
Inje	ection pump no.: 10464	18-0356		(NP-VE4/8F2	325RNP580)			No.	RF7913800D
Pum	p rot.: Clockwise-view	wed from drive	side 7	Test-nozzle	holder comb	ination:	0	Test pressure 1	ine:
			1	L 688 901 0	00			1 680 750 017	
1.	Setting values			P. Speed (rpm)	Sett	ing values	Charge bar (m	-air pressure mHg)	Difference in delivery (cc)
1-1	Time device travel			1375	4.0 - 4.4	(mm)			
1-2	Supply pump pressure			1375	4.4 - 5.0	$kg/cm^2$ )			
1-3	Full load delivery			1375 3	35.4 - 36.4	cc/1000st)			2.5
	Full load delivery				(	cc/1000st)			
1-4	Idle speed regulation	n		360	9.0 - 11.0	cc/1000st)			2.0
1-5	Start			100	above 42.0	cc/1000st)	ł		
1-6	Full-load speed regu	lation		2600 1	LO.8 - 14.8 (	cc/1000st)			
1-7	Load-timer Adjustmen	t		1375	3.4 - 3.8 (	mm)			
2.	Test values	·····				·····	<b>I</b>	l	- <del>///</del>
2-1	Timing device	N = rpm		1375	1800	2325			
		mm		3.9-4.5	6.1-7.3	7.2-8.4			
2-2	Supply pump	N = rpm	600	1375	1800	2325	a.	3. Dimens	ions
		kg/cm <sup>2</sup>	2.2-2.8	4.4- 5.0	5.6-6.2	6.9-7.5			
2-3	Overflow delivery	N = rpm	- 	1375				K 3.2	- 3.4 mm
		cc/10s		46.3-90.3				KF 5.7	- 5.9 mm
2-4	Fuel delivery quantit	ies						MS 1.4	- 1.6 mm
Spee	ed control lever pos.	Pump speed	Fuel	delivery	Charge-air	Differer	nce in	BCS	- mm
		(rpm)	(cc,	/1000st)	pres(mmHg)	delivery	r (cc)	Prestr.	- mm
End	stop	1375	34.	9 - 36.9				Control lever	r angle
		600	29.0	0 - 33.0				α 21°.	- 29° deg
		2325	30.2	2 - 34.2				A 8.8	- 14.1 mm
		2600	9.1	8 - 15.8	1			β 40°.	- 50° dea
		2700	bel	low 6.0				B 12.7	- 16.0 mm
								Y	- dea
								C .	- mm
Swit	ch off	360		0	1				
Idle	-	360	8.0	0 - 12.0	1				
stop	)								
2-5		Cut-in volt	age max.	: 8 V		······································			
Sole	noid	Test voltag	e: 12 -	14 V					

D 9



D10	ZEXEL -	Test specifications
	Injection	pumps

# LOAD TIMER ADJUSTMENT

1. Adjustment

1) Fix the control lever in the position satisfying the following conditions:

Boost Pressure:	-	mmHg
Pump Speed :	1375	rpm
Fuel Injection Quantity:	$28.2 \pm 1$	cc/1000st

2) With the control lever positioned as described in 1) above, adjust the governor sleeve so that the Timer Stroke conforms to the specified values (Item 1-7).

2. Confirmation of Timer Characteristics

Fix the control lever in the position satisfying the following conditions, and confirm the Timer Stroke.

Contro:	l lever position	Specified values				
Pump speed (rpm)	Fuel injection quantity (cc/1000st)	Boost pressure (mmHg)	Timer stroke (mm)	Timer stroke reduction value (mm)		
1375	28.2 ± 1.5	-	3.6 ± 0.3			
1375	16.1 ± 1.5	-	$2.4 \pm 0.7$	-		

SIDE LINK LEVER ADJUSTMENT

- 1. Fix the control lever in the idling position.
- 2. Adjust the connecting rod (3) so that the pin (diameter 5.8 -0.2 mm) is inserted through both the bracket (2) hole and the side link lever (1) hole (section A) to align them.

Then, fix the connecting rod using the nuts.

D 11

**ZEXEL – Test specifications** Injection pumps



D 12

Injection pumps

Figure 13

- 2 = Bracket



1 = Side link lever 3 = Connecting rod

104748-0346 3/4

W-CSD ADJUSTMENT

### 1. Timer Stroke Adjustment

- 1) Calculate the timer stroke from Fig. 15 according to the atmospheric temperature at the time of adjustment.
- 2) Adjust using the screw (1) so that the timer stroke is as calculated in step 1.

# 2. W-FICD Adjustment

1) Adjust using the screw (2) so that the screw (2) length (dimension l) is 12.3±0.5 mm.

# 3. Dimension l Adjustment

- 1) Calculate the gap  $\langle l \rangle$  between the micro switch and the control lever from Fig. 15 according to the atmospheric temperature at the time of adjustment.
- 2) Adjust using the turn bacle so that the gap (l) between the micro switch and the control lever is as calculated in step 1.

Formula for calculating Timer Stroke:

TA  $= -0.04 t + 2.4 (t \ge 0^{\circ}C)$ 

Formula for calculating control lever and micro switch gap:

 $= -0.072 t + 3.6 (t \ge 0^{\circ}C)$ 

D14



Figure 14

Figure 15



D 13	ZEXEL - Test specifications	
	Injection pumps	

a = Atmospheric temperature b = Timer stroke (TA mm)c = Gap between control lever and idling stopper bolt (l mm)



D 15

#### 104748-0346 4/4

DASH POT ADJUSTMENT

- Insert a block gauge (thickness gauge) of thickness 9±1 mm in the gap between the control lever and the idling stopper bolt. (Control lever angle: 13°)
- 2. Adjust the dashpot adjusting screw so that the dashpot adjusting screw and the pushrod are in contact.
  - Fix the screw using the nut.





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ZEXE

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_	-	_

C	O	nc
_	_	

Test oil:		Z	EXEL -	TE	ST VA	LUES							1/4	
ISO 4113 or				Distributors pumps							BOSC	H NO.	9 460 610 333	
SAE J967d		Engine model: CD17					ZEXI	ZEXEL No. 104748						
											Date	:	31.01.1992 [2]	
											Com	any:	NISSAN	
Injection pump no.: 10464	3-2411			(NF	-VE4/8F2	2500LNE	2374)				No.		16700 54A00	
Pump rotation .: Counter c	lockwise-	viewe	ed	Tes	st-nozzle	e holde	er combi	nation:		1	Test pre	ssure 1	ine:	
from drive	e side			16	88 901 0	000					1 680 75	0 017		
1. Setting values				P.	Speed (rpm)		Setti	.ng valu	25	Charge bar (m	-air pre mHq)	ssure	Difference in delivery (cc)	
1-1 Timing device travel					1200	1.5 -	2.1 (	mm)						
1-2 Supply pump pressure					1200	3.1 -	3.7 (	kg/cm²)						
1-3 Full load delivery					1000	27.1 -	29.1 (	cc/1000s	st)				2.5	
Full load delivery				ļ			(	cc/1000s	st)					
1-4 Idle speed regulation					360	3.7 -	6.7 (	cc/1000s	st)					
1-5 Start					100	50.3 -	60.3 (	cc/1000s	t)					
1-6 Full-load speed regul	ation			:	2700	11.8 -	17.8 (	cc/1000s	t)					
1-7														
2. Test values		1			1									
2-1 Timing device		N =	rpm		120	00	18	300	2500					
	mm		mm		1.4 -	2.2	.2 3.5 - 4.7 6.9 - 7.8		. 8					
z-z supply pump		N =	rpm					2500	<u>3. Dimen</u>		sions			
2.2 Overflow delivery		N	Kg/Cill*	<u>cm<sup>2</sup></u> <u>3.0 - 3</u>			.8 4.4 - 5.2 6.1 -		6.1 - 6	.9			•	
2-3 Overflow delivery		14 =	$r_{\rm DIII}$								K 3.2		- 3.4 mm	
2-4 Fuel injection quantit	ies		CC/105	,		00.0	<u> </u>	·····			KP	5.7 -	- 5.9 mm	
Control lever position	Pump S	need	Fuel	deli	VATU	Char	co-air	Dif.	foronao in		MS	1.5 -	- 1.7 mm	
concror rever position	(rpr	n)	(cc/1	000	strokes	Dres	(mmHa)		iverv (ca)		BCS	-	- mm	
End stop	100	0	26	6.	- 28 6	/ pres	(manazy)	<u> </u>	ivery (cc)		Contr	$\cdot$		
	60	0	24		- 28 8						Conce			
	250	0	24	.3 -	- 28.3						VA	15 4	$-1^{\circ}$ deg	
	270	0	11		- 18 3						R	200		
	290	0	b	elow	x 6.0						P		49° deg	
		•	~		. Q. U						2	12 50	14 58dog	
												23.5	4.5-deg	
Switch off	36	0	1		)						<u> </u>	0.0	2.2 aun	
Idle	36	0	3	.2 -	- 7.2				2.5		1			
stop	60	0	b	elow	v 3.0									
Partial load	70	0	10	.8 -	- 19.8	_								
2-5	Cut-in	volt	age max	x.:	8V									
Solenoid	Test vo	oltag	e: 12	- 14	V									

D 16

ZEXEL - Test specifications

Injection pumps



ZEXEL - Test specifications D 17 Injection pumps





Bild 17

104748-2411 2/4

a	=	Measurement	position	"A"
5			~ ~	

b = End face of flange

"A" = Hole

CONTROL LEVER ANGLE MEASUREMENT POSITION

1. Measure the control lever angles ( $\alpha,\ \beta,\ \gamma)$  at hole "A".



ZEXEL - Test specifications Injection pumps





104748-2411 2/4 (Continued)

1 = Adjusting screw 2 = Stop lever

STARTING INJECTION QUANTITY ADJUSTMENT

Adjust the starting injection quantity (item 1-5) using the adjusting screw (as shown in the figure above).



**ZEXEL** – Test specifications

Injection pumps





104748-2411 3/4

- a = Atmospheric temperature
- b = Timer stroke
- c = Gap between control lever and idling stopper bolt
- W-CSD ADJUSTMENT
- 1. Timer Stroke Adjustment
  - Calculate the timer stroke from Fig. 19 (diagram) according to the atmospheric temperature at the time of adjustment.
  - Adjust using the timer stroke adjusting screw so that the timer stroke is as calculated in Step 1).



(Continued)

Formula for calculating Timer Stroke (Diagram):

When	10	≤	t	≤	20	Т	=	-0.	027	t	+	1.09
When	20	≤	t	≤	40	т	=	-0.	0275	t	+	1.1

Formula for calculating control lever and idling stopper bolt gap:

When	28.5	≤ t	: ≤	36	l	=	-0.12	t	+	4.32
When	20	≤ t	t≤	28.5	l	=	-0.235	t	+	7.6
When	10	≤ 1	t≤	20	l		-0.178	t	+	6.3



ZEXEL - Test specifications

Injection pumps





# 104748-2411 4/4

- 1 = Timer stroke adjusting screw
- 2 = Intermediate lever set screw
- 3 = Control lever
- 4 = Intermediate lever
- 5 = Aligning mark
- 6 = Roller
- 7 = CSD lever
- 8 = Idling adjusting screw
- 9 = Idling stopper bolt
- 10 = Control lever
  - a = Block gauge
- 2. Intermediate Lever Position Adjustment



### 2. Intermediate Lever Position Adjustment (continued)

- 1) Insert a block gauge (thickness gauge) of  $4.1 \pm 0.05$  mm thickness between the control lever and the idling stopper bolt.
- 2) Align the intermediate lever with the aligning mark.
- 3) Adjust the intermediate lever set screw so that the control lever and the intermediate lever set screw are in contact, and then fix in position using the locknut.

# 3. CSD Lever Adjustment

- 1) Calculate the block gauge dimension  $l \pm 0.05$  mm from (Fig. 19) according to the atmospheric temperature at the time of adjustment.
- 2) Insert the block gauge (thickness gauge) (selected in Fig. 19) between the bracket and the idling stopper bolt. Fix the screw using the nut.
- 3) Using the idling bolt, adjust so that the CSD lever roller and the intermediate lever are in contact.

#### Note:

- The temperature of the wax must be below 30°C when adjusting.
- When inserting a block rege (thickness gauge) between the control lever (Lracket) and the idling stopper bolt, use the idling adjusting bolt to separate the CSD lever and the intermediate lever so that no excessive force is exerted on them.

D 23

ZEXEL - Test specifications Injection pumps



Test oil: ISÓ 4113 or SAE J967d

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ZEXEL - TEST VALUES Distributors pumps Engine model: CD17

											Duc	
				/577							Con	npan
Injection pump no.: 10464	8-2630			(NF	-VE4/8F	2500LNE	2715)			<u>_</u>	No.	,
Pump rotation.: Counter c.	LOCKWISE-	viewe	a	Tes	C-NOZZI	e nolde	er combi	nation:			Test pr	ress
Irom drive	e side			T P	000 001		0 - 4 - 1 - 1			1	1 680 7	/50
1. Setting values				P.	Speed		Setti	ng valu	es	Char	ge-air pr	cessi
1 1 mining densing turnel				·	1200		0 1 /-			bar	(mmHg)	
1-1 Timing device travel					1200	1.5 -	2.1 (n	(m)				
1-2 Supply pump pressure					1200	3.1 -	3./ ()	(g/cm²)	- <b>-</b> \			
Full load delivery					1000	27.1 -	20.1 (0	$\frac{1000}{2}$	5C) -+ \			
1-4 Idle speed regulation				ĺ	360	27-	67 (0	$\frac{1000}{2}$	5C)			
1-4 fulle speed regulation				ļ	100	50 3 -	70 2 /	$\frac{1000}{20}$	st)			
1-6 Full-load speed regul	ation				2700	11 8 -	17 8 (6	rc/1000s	st)			
1-7	ación			ĺ	2700	TT.0 -	17.0 (0			l		
2. Test values				I								
2-1 Timing device	···· ··· ··· ··· ··· ··· ··· ·	N =	rpm		12	:00	18	00	2500			
-			mm		1.4	- 2.2	3.5	- 4.7	6.9 - 7	.8		
2-2 Supply pump		N = rpm		1200		:00	1800		2500		3.	Di
kg/cr		kg/cm <sup>2</sup>		3.0 -		4.4 - 5.2		6.1 - 6.9			T	
2-3 Overflow delivery		N =	rpm		12	00					K	
			cc/10s		36.0	- 80.0					KF	
2-4 Fuel injection quantit	ies										MS	
Control lever position	Pump S	peed	Fuel (	deli	very	Char	ge-air	Dif	ference in	1	BCS	
······································	(rpr	n)	(cc/1	000	strokes	) pres	s (mmHg)	de]	ivery (cc)		Pre-st	$\mathbf{x}$ .
End stop	100	0	26	.6 .	- 28.6						Cont	rol
	60	0	24	.8 -	- 28.8						α	
	250	0	24	.3 -	- 28.3						Ya	1
	270	0	11		- 19.3						β	
	290	0	b	elov	v 6.0						В	1
											γ	1
											С	
Switch off	36	0		(	)							
Idle	36	0	3	.2 -	- 7.2				2.5			
stop	60	0	b	elow	v 3.0						ł	
Partial load	70	0	10	.8 -	19.8							
2-5	Cut-in	volt	age ma	x.:	8V							
Solenoid	Test vo	oltag	e: 12	- 14	V							

E1

Injection pumps

ZEXEL - Test specifications E 2 Injection pumps

				1/4
H	No.	94	60 610	385
L	No.	104	748-263	0
:		31.	01.1992	[0]
a	ny:	NIS	SAN	
Ĩ		167	00 54AC	3
s	sure 1	line:		
0	017			
s	sure	Diff	erence	in
		deli	very (	cc)
			2.5	
_				
1	imen	sion	8	
		-		ļ
	3.2	- 3.4	mm	
	5.7	- 5.9	mm	
	1.7	- 1.9	mm	-
		-	mm	
1			mm	
	Leve	r angle	2	
	1°	1°	deg	
_	15.4	- 18.1	mm	
	39°	- 49°	deg	
	11.0	- 16.0	mm	
	13.5°	- 14.5	deg	1
	8.6	- 9.2	mm	

BOSCH

ZEXEL Date:



104748-2630 2/4

- a = Atmospheric temperature
- b = Timer stroke
- c = Gap between control lever and idling stopper bolt
  - W-CSD ADJUSTMENT
- 1. Timer Stroke Adjustment
  - Calculate the timer stroke from Fig. 21 (diagram) according to the atmospheric temperature at the time of adjustment.
  - Adjust using the timer stroke adjusting screw (1) so that the timer stroke is as calculated in Step 1).







Figure	22
--------	----

1 = Timer stroke adjusting screw	5 = Control lever	. 9 =
2 = Roller	6 = Aligning mark	10 =
3 = Intermediate lever	7 = CSD lever	
4 = Intermediate lever set screw	8 = Idling adjusting screw	

2. Intermediate Lever Position Adjustment (continued)

- 1) Insert a block gauge (thickness gauge) of 4.05 4.15 mm thickness between the control lever and the idling stopper bolt.
- 2) Align the intermediate lever with the aligning mark.
- 3) Adjust the intermediate lever set screw so that the control lever and the intermediate lever set screw are in contact, and then fix in position using the locknut.

E A	ZEXEL - Test specifications	
<b>E4</b>	Injection pumps	

5	ZEXEL - Test specifications
	Injection pumps

104748-2630 4/4

Idling stopper bolt Control lever



### 3. CSD Lever Adjustment (adjust to the thick line)

- 1) Calculate the block gauge dimension  $l \pm 0.05$  mm from (Fig. 21) according to the atmospheric temperature at the time of adjustment.
- 2) Insert the block gauge (thickness gauge) between the control lever and the idling stopper bolt.
- 3) Using the idling bolt, adjust so that the CSD lever roller and the intermediate lever are in contact.

#### Note:

- The temperature of the wax must be below 30°C when adjusting.
- When inserting a block gauge (thickness gauge) between the control lever (bracket) and the idling stopper bolt, use the idling adjusting bolt to separate the CSD lever and the intermediate lever so that no excessive force is exerted on them.

ZEXEL - Test specifications

Injection pumps



Bild 23

104748-2630 4/4

CONTROL LEVER ANGLE MEASUREMENT POSITION

1. Measure the control lever angles ( ,  $\beta,~\gamma)$  at hole "A".



Test oil:

ZEXEL - TEST VALUES

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BOSCH	No.		94	60 610 507
ZEXEL	No.		104	749-0312
Date:			31.	01.1992 [0]
Compa	ny:		MAZ	DA
No.			483	813800A
st pres	sure ]	i	ne:	
680 750	017			
ir pres	sure		Diff	erence in
g)			deli	very (cc)
				2.5
				2.5
			1	
2		_	4	
3. 0.	Lmen	8	101	5
ĸ	2 2 2	_	34	mm
KF	57	_	59	mm
MS	1.7	_	1.9	mm
BCS				mm
Pre-str.		-		mm
Control	lleve	r	angle	2
α	31°	-	390	deg
A	2.5	-	7.7	mm
β	45°	-	55°	deg
В	12.1	-	16.6	mm
γ		-		deg
С		-		mm
				1

ISO 4113 or				Dis	stributor	rs pump	s				BOSC	H No.	9 460 610 507
SAE J967d				Eng	gine mode	el: S2					ZEXE	L No.	104749-0312
											Date	•	31.01.1992 [0]
											Compa	any:	MAZDA
Injection pump no.: 104649	-0312			(NE	<u>-VE4/9F2</u>	2125LNF	2372)				No.		483813800A
Pump rotation.: Counter clo	ockwise-	viewe	ed	Tes	st-nozzle	e holde	er combi	nation:		Те	st pre	ssure 1	ine:
from drive	side			16	88 901 0	000				1	680 75	0 017	
1. Setting values				P.	Speed		Setti	ng value	es	Charge-a	ir pre	ssure	Difference in
					(rpm)					bar (mmH	g)		delivery (cc)
1-1 Timing device travel					1250	1.3 -	1.7 (1	mm)					
1-2 Supply pump pressure					1250	3.8 -	4.4 ()	kg/cm²)					
1-3 Full load delivery					1500	40.0 -	41.0 (	cc/1000s	it)				2.5
Full load delivery							()	cc/1000s	it)				,
1-4 Idle speed regulation					325	5.2 -	9.2 (	cc/1000s	it)				2.5
1-5 Start					100	above	65.0 (	cc/1000s	it)				
1-6 Full-load speed regula	tion				2400	9.6 -	13.6 (	cc/1000s	it)				
1-7		.~	<u></u>						·····				
2. Test values			· · · · ·		<u>.</u>		1						
2-1 Timing device		N =	rpm		125	50	15	500	2125				
			mm		1.2 -	1.8	2.8	- 4.0	8.2 - 9	.4			
2-2 Supply pump		N =	rpm		50	10		250	2125		3. D	imen	sions
			kg/cm*	•	1.3 -	1.9	3.8	- 4.4	6.8 - 7	.4			
2-3 Overilow delivery		N =	rpm		125	07.0					K	3.2	- 3.4 mm
2.4 Eucl injection montiti			CC/105	• 	53.0 -	97.0					KF'	5.7	- 5.9 mm
2-4 Fuel Injection quantity	Dump C	nood	17407	4-14		Char			· · · · · ·		MS	1.7	- 1.9 mm
control lever position	Pump S	peed	ruer (	dell	.very	Char	ge-air	DII	ierence in		BCS	· ·	- mm
	150	0			strokes)	pres	(mmHg)	del	ivery (cc)		Pre-str.	· · ·	- mm
End stop	150	0		·. 5 ·	- 41.5						Contro	1 lever	r angle
	500			.5	- 34.5						α	31°	- 39° deg
	212	ວ . ດ		.4	- 37.4						A	2.5	- 7.7 mm
	2400		8		- 14.6						ц В	45°	- 55° deg
	250	0	<u>م</u>	etoi	N 8.6						В	12.1	- 16.6 mm
											γ	-	- deg
Switch off	32	5			0						<u> </u>	<u> </u>	
	32	5	When	the	stop lev	I Zer ope	rated 0						
Idle	32	5	5	.2 .	- 9.2			<u></u>					
stop	below	430		(	)								
2-5	Cut-in	volt	age ma	x.:	8V	l		£					
Solenoid	Test vo	ltag	e: 12	- 14	V								

**E8** 

ZEXEL - Test specifications Injection pumps



ZEXEL - Test specifications E9 Injection pumps

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Dat	te	:

Test oil	Z	EXEL - T	EST VA	LUES				1/
ISO 4113 or		Di	stributo	r pumps			BOSCH No.	9 460 610 502
SAE J967d		Er	gine mod	el: RFX			ZEXEL No.	104749-0470
							Date:	31.01.1992 [0
							Company:	MAZDA
Injection pump no.: 10464	19-0470	(1)	IP-VE4/9F	2150RNP556)			No.	RF7113800E
Pump rot.: Clockwise-view	ved from drive	side Te	st-nozzl	e holder comb:	ination:		Test pressure 1	ine:
		1	688 901	000			1 680 750 017	
		P.	Speed	Sett	ing values	Charge	e-air pressure	Difference in
1. Setting values		<u>.</u>	(rpm)	, 		h	oar (mmHg)	delivery (cc)
1-1 Timing device travel			1500	4.4 - 4.8	(mm)		640 - 660	
1-2 Supply pump pressure			1500	5.2 - 5.8 (	(kg/cm <sup>2</sup> )		640 - 660	·
1-3 Full load delivery		10	00 FULL	48.7 - 49.7 (	(cc/1000st)		640 - 660	4.0
Full load delivery		10	00 BCS	44.7 - 45.7 (	(cc/1000st)		290 - 310	3.5
1-4 Idle speed regulation	n		360	8.0 - 10.0 (	(cc/1000st)		0	2.0
1-5 Start			100	above 55.0 (	(cc/1000st)		0	
1-6 Full-load speed regu	lation		2250	33.2 - 37.2 (	(cc/1000st)		640 - 660	
1-7 Load-timer adjustmen	t		1500	T-0.2-0.6	(mm)		640 - 660	
2. Test values						~		
2-1 Timing device	N = rpm	750	1250	1500				
	mm	below 1.	1 2.7-3.	9 4.3-4.9			<b></b>	
2-2 Supply pump	N = rpm			1500	2150		3. Dimens	ions
	kg/cm <sup>2</sup>			5.2-5.8	6.8-7.4			
2-3 Overflow delivery	N = rpm	1000					K 3.2	- 3.4 mm
	cc/10s	41.0-85.	0				KF 5.7	- 5.9 mm
2-4 Fuel injection quanti	ties						MS 1.6	- 1.8 mm
Speed control lever pos.	Pump speed	Fuel	delivery	Charge-air	Difference	in	BCS 3.9	- 4.1 mm
	(rpm)	(cc/	1000st)	pres(mmHg)	delivery	cc)	Pre-st. 0.28	- 0.32 mm
End stop	1000 FULL	48.2	- 50.2	640 - 660			Control leve	r angle
	1000 BCS	44.2	- 46.2	290 - 310			α 21°	- 29° deg
	600	33.5	- 38.5	0			A 8.8	- 14.1 mm
	2150	.38.6	- 43.6	640 - 660			β 39°	- 55° deg
	2250	32.7	- 37.7	640 - 660			B 12.3	- 14.2 mm
	2550	8.0	- 15.0	640 - 660		1	γ	- deg
	2700	bel	ow 3.0	640 - 660			с	- mm
Switch off	360		0	0				
Idle-	450	bel	ow 3.0	0	-			
stop	360	8.0	- 10.0	0				
2-5	Cut-in volt	age max.	8 V					
Solenoid	Test voltag	e: 12 - 1	14 V					

E 10

ZEXEL - Test specifications Injection pumps



ZEXEL - Test specifications E11 Injection pumps

LOAD TIMER ADJUSTMENT

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- 1. Adjustment
  - 1) Fix the control lever in the position satisfying the following conditions:

Boost Pressure:	640 - 660	mmHg	
Pump Speed :	1500	rpm	
Fuel Injection Quantity:	34.5 - 35.5	cc/1000st	

- 2) With the control lever positioned as described in 1) above, adjust the governor sleeve so that the Timer Stroke conforms to the specified values (1 7).
- 2. Confirmation of Timer Characteristics

Fix the control lever in the position satisfying the following conditions, and confirm the Timer Stroke.

Contro	l lever position	Specifie	d values	
Pump speed (rpm)	Fuel injection quantity (cc/1000st)	Boost pressure (mmHg)	Timer stroke (mm)	Timer stroke reduction value (mm)
1500	34.0 - 36.0	640 - 660	-	0.1 - 0.7
1500	28.5 - 31.5	640 - 660	-	0.4 - 1.2

F 10	ZEXEL - Test specifications	F 10	ZEXEL - Test specification
EIZ	Injection pumps	E13	Injection pumps





104749-0470 3/4

- 1 = Side link lever
- 2 = Bracket
- 3 = Connecting rod

SIDE LINK LEVER ADJUSTMENT

1. Fix the control lever in the idling position.

2. Adjust the connecting rod (3) so that the pin (diameter 5.8 -0.2 mm) is inserted through both the bracket (2) hole and the side link lever (1) hole (section A) to align them.

# **ZEXEL** - Test specifications







Injection pumps

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ZEXEL - Test specific Injection pumps

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		ZEXEL	- TEST V	ALUES						1/
ISO 4113 or			Distribut	ors pump	<b>ps</b>				BOSCH No.	9 460 610 425
SAE J9670		Engine mo	del: LD2	20				ZEXEL NO.	104749-2152	
									Date:	31.01.1992 [0]
			1000 000 10						Company:	NISSAN
Injection pump no.: 10464	9-2122		(NP-VE4/9	F2500RNI	20)	<u></u>			No.	16700 43S00
Pump rot.: Clockwise-view	ved from dr	ive side	Test-nozz 1 688 901	le holde 000	er combi	.nation:			Test pressure : 1 680 750 017	line:
1. Setting values	•		P. Speed (rpm)		Setti	ng valu	es	Charg bar (	e-air pressure mmHq)	Difference in delivery (cc)
1-1 Timing device travel			900	1.1 -	1.7 (	mm)		,		
1-2 Supply pump pressure			900	2.9 -	3.5 (	kg/cm <sup>2</sup> )				
1-3 Full load delivery			900	32.5 -	33.5 (	cc/1000s	st)			2.5
Full load delivery					(	cc/1000s	st)			
1-4 Idle speed regulation	n		325	6.7 -	9.7 (	cc/1000s	st)			
1-5 Start			100	above	52.0 (	cc/1000s	st)			
1-6 Full-load speed regul 1-7	lation		2700	7.2 -	13.2 (	cc/1000s	;t)			
2. Test values										£
2-1 Timing device	1	N = rpm		900	11	300	2300			
		mm	1.0	- 1.8	4.5	- 5.7	6.9 - 7	. 8		
2-2 Supply pump	1	N = rpm		900	1	300	2300		3. Dimen	sions
	·····	kg/cm <sup>2</sup>	2 2.8	- 3.6	4.9	- 5.7	6.2 - 7	.0		
2-3 Overflow delivery	1	N = rpm	1	000					K 3.2	- 3.4 mm
		cc/10s	36.0 - 80.0				KF 5.7	- 5.9 mm		
2-4 Fuel injection quanti	ties					r			MS 1.1	- 1.3 mm
Control lever position	Pump Sp	eed Fuel	delivery	Char	ge-air	Dif	ference in		BCS	- mm
	(rpm)	(cc/1	000 stroke	s) pres	s(mmHg)	del	ivery (cc)		Pre-str.	- mm ·
End stop	900	32	2.0 - 34.0						Control leve	r angle
	600	31	1.2 - 35.2						α 56°	- 60° deg
	2300	30	0.6 - 34.6						Ya 8.9	- 13.2 mm
	2700	e	5.7 - 13.7			ĺ			β 36°	- 46° deg
	2800	Ľ	below $6.0$						B 11.0	- 14.5 mm
									γ 10.5	- 11.5 deg
Cuitch off									C 6.7	- 7.3 mm
SWILCH OIL	325		0							
	325	6	0.2 - 10.2		2.5					
Partial load	500		Delow 4.0						1	
S E FERRET TONG	900	5	0 - 15.0			L				
2-3 Colonoid	Cut-in v	oltage ma	x.: 8V							
poteuola	Test vol	rage: 12	- 14V					1		

E17

ZEXEL - Test specifications Injection pumps

F10	ZEXEL -	Test	specification
FIR	Injection	pump	S



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Bild 27

E19

104749-2152 2/2

- a = Hole
- b = End face of flange

CONTROL LEVER ANGLE MEASUREMENT POSITION

1. Measure the control lever angles ( $\alpha$ ,  $\beta$ ,  $\gamma$ ) at hole "A".



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Test oil:		ZEXEL -	TEST V	ALUES						1/3
ISC 4113 or			Distribut	ors pump	ps				BOSCH No.	9 460 610 521
SAE J967d			Engine mo	del: LD2	20				ZEXEL NO.	104749-2232
									Date:	31.01.1992 [0]
									Company:	MISA
Injection pump no.: 104649	9-2232		(NP-VE4/9	F2200RNI	2465)				No.	16700 D9702
Pump rot.: Clockwise-viewe	ed from dr	ive side	Test-nozz	le holde	er comb	ination:		Te	st pressure 1	line:
			1 688 901	000				1 (	580 750 017	
1. Setting values			P. Speed (rpm)		Sett	ing value	es	Charge-a: bar (mmHg	ir pressure g)	Difference in delivery (cc)
1-1 Timing device travel			900	1.3 -	1.7	(mm)				
1-2 Supply pump pressure			900	3.2 -	3.8	kg/cm <sup>2</sup> )				
1-3 Full load delivery			2200	29.3 -	30.3	cc/1000s	it)			2.5
Full load delivery				15	(	cc/1000s	:t)			
1-4 Idle speed regulation			350	4.7 -	7.7	cc/1000s	it)			
1-5 Start			100	40.0 -	50.0	cc/1000s	t)			
1-6 Full-load speed regul	ation		2570	10.4 -	16.4	cc/1000s	t)			
1-7 Load-timer Adjustment			900	T-0.45	-0.85 (	(mm)				
2. Test values				·						
2-1 Timing device	1	N = rpm		900	1	800	2200			
		mm	1.2	- 1.8	5.5	- 6.7	7.2 - 8	.4		
2-2 Supply pump 2-3 Overflow delivery		N = rpm		900	1	800	2200		3. Dimen	sions
		kg/cm <sup>2</sup>	2 3.1	- 3.9	5.1	- 5.9	6.0 - 6	. 8		
		N = rpm		900					K 3.2	- 3.4 mm
		cc/10s	35.0	- 79.0					KF 5.7	- 5.9 mm
2-4 Fuel injection quantit	ies								MS 1.1	- 1.3 mm
Control lever position	Pump Sp	eed Fuel	delivery	Char	ge-air	Dif	ference in	1	BCS	– mm
	(rpm)	(cc/1	.000 stroke	s) pres	s (mmHg)	del	ivery (cc)		Pre-str.	– mm
End stop	2200	28	8.8 - 30.8			1			Control leve	r angle
	900	2	7.6 - 31.6					1 1	α 21°	- 29° deg
	2570		9.9 - 16.9						YA 4.3	- 9.6 mm
	2800	1	below 6.0						β 36°	- 46° deg
									B 10.9	- 14.6 mm
									y 10.5°	- 11.5°deg
									C 6.9	- 7.5 mm
Switch off	350		0							
Idle	350	4	1.2 - 8.2		2.5					
stop	500	1	below 3.0							
Partial load	900	4	1.1 - 14.1							
2-5	Cut-in v	oltage ma	IX.: 8V				· · · · · · · · · · · · · · · · · · ·	1		
Solenoid	Test voltage: 12 - 14V									

E 20

ZEXEL - Test specifications Injection pumps



ZEXEL - Test specifications E 21 Injection pumps
LOAD TIMER ADJUSTMENT

- 1. Adjustment
  - 1) Fix the control lever in the position satisfying the following conditions:

Boost Pro	essure:	-	mmHg
Pump Spe	ed :	900	rpm
Fuel Inj	ection Quantity:	16.0 - 18.0	cc/1000st

2) With the control lever positioned as described in 1) above, adjust the governor sleeve so that the Timer Stroke conforms to the specified values (1-7).

2. Confirmation of Timer Characteristics

Fix the control lever in the position satisfying the following conditions, and confirm the Timer Stroke.

Control	lever position		Specifie	d values
Pump speed (rpm)	Fuel injection quantity (cc/1000st)	Boost pressure (mmHg)	Timer stroke (mm)	Timer stroke reduction value (mm)
900	-	-	-	0.45 - 0.85
900	-	-	-	0.45 - 0.85

Figure 28 1 = Locknut

STARTING INJECTION QUANTITY ADJUSTMENT

Adjust the starting injection quantity (page 1/3) using the adjusting bolt (as shown in the figure at right).

**ZEXEL** - Test specifications



T OO	ZEXEL -	Test	specification
£23	Injection	pump	)S







104749-2232 3/3

M-CSD ADJUSTMENT

- 1. Fix the intermediate lever adjustment screw in position (adjust with the M-CSD released)
  - 1) Hold the control lever (3) in the idling position.
  - 2) Move the adjusting screw to a horizontal position.
  - Adjust using the adjusting screw (1) so that the gap between the control lever (3) and the adjusting screw (1) is 1 - 2 mm, and then fix the screw using the nut.

E24 ZEXEL - Test specifications



### (Continued)

## 2. Fixing the M-CSD Stopper (9)

- Turn the drive shaft slowly and fix the drive shaft in a position where a load is applied (the point where the roller holder contacts the cam surface of the cam disc).
- 2) Move the CSD lever (6) to the advance side.
- 3) Fix the CSD lever in the position where the ball pin at the tip of the shaft lightly contacts the roller holder (roller holder advance angle "0".
- 4) Move the M-CSD lever (6) until il contacts the stopper (9), and check that the timer stroke at this point is 1.03 1.43 mm.

#### 3. Screw (7) Adjustment

- 1) Operate the CSD lever (6) move the CSD lever until it contacts the stopper (9).
- 2) Then, adjust the screw (7) so that the clearance between the control lever and the idling stopper bolt is  $7.2 \pm 0.5$  mm (control lever angle 11°), and fix the screw (7) using the nut (8).

ì	r or	ZEXEL -	Test specifications	
	E25	Injection	pumps	
10.				

Test oil		ZEXEL - T	EST VA	LUES				1/3
ISO 4113 or	· ·	Di	stributor	pumps			BOSCH No.	9 460 610 473
SAE J967d		En	gine mode	el: TD42			ZEXEL NO.	104760-4161
							Date:	31.01.1992 [0]
							Company:	NISSAN DIESEL
Injection pump no.: 1046	50-4161	(N	P-VE6/10F	2000RNP102)			No.	16700 34T03
Pump rot.: Clockwise-view	wed from drive	side Te	st-nozzle	holder comb	ination:		Test pressure	line:
		1	688 901 0	00			1 680 750 017	
1. Setting values		Þ	. Speed	Sett	ing values	Cha	hrge-air pressure	Difference in
1-1 Timing device travel			1000	1.4 - 1.8	(mm)		Dat (maily)	· delively (cc)
1-2 Supply pump pressure			1000	3.9 - 4.3	(kg/cm <sup>2</sup> )			
1-3 Full load delivery			1000	47.3 - 48.3	(cc/1000st)			3.5
Full load delivery					(cc/1000st)			
1-4 Idle speed regulatio	n		350	6.8 - 10.8	(cc/1000st)			2.0
1-5 Start			300	53.0 - 57.0	(cc/1000st)			
1-6 Full-load speed regu	lation	1	2300	14.7 - 18.7	(cc/1000st)			5.0
1-7 Load-timer adjustmen	t							
2. Test values								
2-1 Timing device	N = rpm	1000		1800	2300			
	mm	1.3- 1.9	9	5.2-6.4	6.8-7.8			
2-2 Supply pump	N = rpm	1000	1600	1800			3. Dimen	sions
	kg/cm <sup>2</sup>	3.9-4.3	3 5.2-5.8	5.8-6.4				
2-3 Overflow delivery	N = rpm	1000					К 3.2	- 3.4 mm
	cc/10s	45.0-88.0					KF 6.34	- 6.54 mm
2-4 Fuel injection quant	ties	··· . · · · · · · · · · · · · · · · · ·					MS 1.0	- 1.2 mm
Speed control lever pos.	P. Speed	Fuel o	delivery	Charge-air	Differe	ence in	BCS	– mm
· · · · · · · · · · · · · · · · · · ·	(rpm)	(cc/1	1000st)	pres(mmHg)	deliver	ry (cc)	Pre-st.	– mm
End stop	1000	46.8	- 48.8				Control lev	er angle
	600	46.9	- 50.9				α 51.5	°- 69.5°deg
	2000	39.4	- 43.6				Ya 24.3	- 28.7 mm
	2100	35.8	- 44.8				β 35	°-45° deg
1	2300	14.2	- 19.2				B 10.6	- 14.3 mm
	2500	below	v 5.0				Ŷ	- deg
Switch off	350		0					- 11uA
Idle-	450	belo	ow 3.0	-				
stop	350	6.8	- 10.8					
2-5	Cut-in volt	tage max.:	16V					
Solenoid	Test voltag	ge: 24 - 2	6V					· · · · ·

**F1** 

ZEXEL - Test specifications

Injection pumps

ZEXEL - Test specifications F2 Injection pumps



### 104760-4161 2/3

1 = Idling position

ACCELERATOR SWITCH ADJUSTMENT

- 1. Insert a block gauge of 3.3 mm thickness between the idling stopper bolt and the bracket (control lever angle:  $5^{\circ} \pm 2^{\circ}$ ).
- 2. Then, adjust the installation position of the accelerator switch so that it is turned OFF.



F3

ZEXEL - Test specifications

Injection pumps



# 104760-4161 3/3

- 1 = Lever
- 2 = Adjusting bolt
- 3 = Locknut

STARTING INJECTION QUANTITY ADJUSTMENT

Adjust the starting injection quantity (item 1-5) using the adjusting bolt.



ZEXEL - Test specifications

Injection pumps





104760-4161 3/3 (Continued)

CONTROL LEVER ANGLE MEASUREMENT POSITION

1. Measure the control lever angles ( $\alpha,\ \beta,\ \gamma)$  at hole "A".



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BOSCH	No.	94	60 610	415
ZEXEL	No.	104	769-210	)5
Date:		31.	01.1992	[0]
Compa	ny:	NIS	SAN	
No.		167	00 V721	.3
st pres	sure 1	line:		
680 750	017			
air pres	ssure	Diff	erence	in
(mmHg)		deli	very (	cc)
			2.5	
		•		
3. D11	nens	1018		
••				
K KD	3.2	- 3.4	mm	
KF	5.54	- 6.74	mm	
MS	1.7	- 1.9	mm	
BCS		-	mm	
Pre-sc.	<u> </u>	-	mm	
Contro	L Leve	r angle	2	{
α	19°	- 27°	deg	
A	8.7	- 12.9	mm	
þ	37°	- 47°	deg	
В	11.5	- 15.2	mm	
γ	10.5°	- 11.59	°deg	
С	5.7	- 6.3	mm	

Cor	npa
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Test oil		ZEXEL - S	TEST VA	ALUES						1/4
ISO 4113 or		I	Distributo	or pumps				BOSCH	I No.	9 460 610 415
SAE J967d		I	Engine mod	lel: RD28				ZEXEI	No.	104769-2105
								Date		31.01.1992 [0]
								Compa	iny:	NISSAN
Injection pump no.: 10466	9-2113		(NP-VE6/9F	2500RNP40)				No.		16700 V7213
Pump rot.: Clockwise-view	ed from drive	side 7	Test-nozzl	e holder combi	nation:		Te	est pres	ssure 1	ine:
		1	1 688 901	000			1	680 750	017	
1. Setting values			P. Speed	Setti	ng values		Charge-	air pre	ssure	Difference in
			(rpm)				bai	r (mmHg)		delivery (cc)
1-1 Timing device travel			900	1.2 - 1.6 (r	nm)					
1-2 Supply pump pressure			900	3.5 - 4.1 ()	(g/cm²)				1	
1-3 Full load delivery			900	30.9 - 31.9 (0	cc/1000st)	·				2.5
Full load delivery				((	cc/1000st)				-	
1-4 Idle speed regulation	1	1	350	5.8 - 8.8 (0	cc/1000st)					
1-5 Start			100	above 38.0 (c	cc/1000st)					
1-6 Full-load speed regul	lation		2600	15.5 - 21.5 (0	cc/1000st)					
1-7 Load-timer adjustment			:		· · · · · · · · · · · · · · · · · · ·					
2. Test values	T	T		· · · · · · · · · · · · · · · · · · ·		<b></b>				
2-1 Timing device	N = rpm	900	1200		2300					
	mm	1.1-1	.7 2.9-3.	7	8.1-9.0			<u> </u>		-
2-2 Supply pump	N = rpm	900		1800		2500		3. Di	mens:	ions
	kg/cm <sup>2</sup>	3.4-4	.2	5.5-6.3		7.2-8.	.0			
2-3 Overflow delivery	N = rpm	900						K	3.2	- 3.4 mm
	cc/10s	43.0-87	.0]		<u> </u>			KF	6.54	- 6.74 mm
2-4 Fuel injection quanti	ties					······································		MS	1.7	- 1.9 mm
Speed control lever pos.	P. Speed	Fuel	delivery	Charge-air	Differ	ence in		BCS	· ·	- mm
	(rpm)	(cc	/1000st)	pres(mmHg)	delive	ry (cc)		Pre-st.	<u> </u>	- mm
End stop	900	30.	4 - 32.4					Contro	<u>l leve</u>	r angle
	600	29.	1 - 33.1					α	19°.	- 27° deg
	2300	28.	0 - 32.0				1	A	8.7	- 12.9 mm
	2600	15.	0 - 22.0					β	37°.	- 47° deg
	2800	be be	low 5.0					B	11.5	- 15.2 mm
								γ	10.5°	- 11.5°deg
		_						С	5.7	- 6.3 mm
Switch off	350		0				1			
Idle-	350	5.	3 - 9.3	1.9						
stop	500	be	low 4.0							
Partial load	900	2.	5 - 12.5					Į		
2-5	Cut-in vol	tage max	.: 8V					1		
Solenoid	Test volta	ge: 12 -	14V							

**F6** 

ZEXEL - Test specifications





ZEXEL - Test specifications F7 Injection pumps





#### 104769-2105 2/4

- 1 = Idling stopper bolt
- 2 = Accelerator Switch
- 3 = Accelerator switch adjustment screw
- 4 = Lock nut
- 5 = Bracket

a = Block gauge

- ACCELERATOR SWITCH ADJUSTMENT
- 1. Adjust so that the accelerator switch adjustment screw protrudes 4 mm from the locknut, and then lock in position.
- 2. Insert a block gauge of 2.6  $\pm$  0.1 mm thickness between the idling stopper bolt and the bracket.
- 3. Then, adjust the installation position of the accelerator switch so that it is turned OFF.





104769-2105 3/4

- 1 = Idling stopper bolt
- 2 = Dash potschraube
- 3 = Dash pot adjusting screw
- 4 = Bracket
- 5 = Block gauge
- 6 = Control lever

DASH POT ADJUSTMENT

- 1. Insert a block gauge (thickness gauge) of thickness 2.7  $\pm$  0.05 mm in the gap between the control lever and the idling stopper bolt.
- 2. With the control lever positioned as described in 1.above, adjust the dashpot adjusting screw so that the dashpot adjusting screw and the push rod are in contact.

Fix the screw using the nut.





Bild 35

104769-2105 3/4 (Continued)

1 = ISC Actuator

2 = Bracket

ISC (Idle Speed Control) ACTUATOR INSTALLATION

- 1. Hold the control lever in the idling position
- 2. Adjust the position of the actuator bracket so that the gap between the contol lever and the ISC lever roller is

1.0<sup>+0.1</sup>mm -0.5mm

Then fix the bracket in position.







- = W-CSD 1
- = Timer stroke adjusting screw 2
- W-CSD ADJUSTMENT
- 1. Timer Stroke Adjustment (Refer to Figs. 36 and 37)
  - 1) Using the graph (Figure 37), determine the timer stroke according to the atmospheric temperature at the time of adjustment.
  - 2) Adjust using the timer stroke adjusting bolt so that the timer stroke corresponds to the value determined in the note 1) above.



**ZEXEL - Test specifications** Injection pumps

E10	ZEXEL - Test specifications	
<b>FIZ</b>	Injection pumps	

Figure 37

a = Atmospheric temperature

b = Timer stroke

(t℃)

104769-2105 4/4

Test oil:		2	ZEXEL -	TESI	r vai	LUES							1/
ISO 4113 or				Distri	ibutor	s pump	S				BOSCI	H No.	9 460 610 516
SAE J967d				Engine	e mode	1: RD2	8				ZEXE	L No.	104769-2175
											Date	:	31.01.1992 [0
											Compa	any:	NISSAN
Injection pump no.: 104669-	-2175			(NP-VE	E6/9F2	500RNP	59)				No.		16700 C9601
Pump rot.: Clockwise-viewed	l from d	lrive	side	Test-r	nozzle	holde	r combi	nation:		ſ	est pres	ssure 1	ine:
				1 688	901 0	00				1	. 680 750	017	
1. Setting values				P. Sp	beed		Setti	ng value	es	Charge-	air pres	ssure	Difference in
				(rpr	m)				·	bar (mm	nHg)		delivery (cc)
1-1 Timing device travel				120	0	2.0 -	2.4 (1	nm)					
1-2 Supply pump pressure				120	0	4.2 -	4.8 (]	kg/cm²)					
1-3 Full load delivery				90	0 2	29.0 -	30.0 (0	cc/1000s	it)				2.5
Full load delivery							( (	cc/1000s	it)				
1-4 Idle speed regulation				35	0	5.8 -	8.8 (@	cc/1000s	it)				1.4
1-5 Start			4	10	0	above	38.0 (0	cc/1000s	t)				20.0
1-6 Full-load speed regulat	tion			260	0 1	15.5 -	21.5 (0	cc/1000s	た)			]	5.0
1-7										L			
2. Test values		T											
2-1 Timing device		N =	rpm		120	0	18	00	2500				
			mm		1.9 -	2.5	4.9	- 5.7	7.3 - 8.	2	r		
2-2 Supply pump		N =	rpm		120	0	18	00	2500		3. D	imena	lions
			kg/cm <sup>2</sup>		4.1 -	4.9	5.5	- 6.3	7.2 - 8.	0			
2-3 Overflow delivery		N =	rpm		120	0					K	3.2 -	3.4 mm
	<u>.</u>	<u> </u>	CC/105	4	8.0 -	92.0					KF	6.54 -	6.74 mm
2-4 Fuel injection quantiti											MS	1.7 -	1.9 mm
Control lever position	Pump S	peea	Fuel a	eliver	ry	Char	ge-air	Dif	ference in		BCS		mm
		<u>n)</u>	(CC/10	00 str	rokes)	pres	(mmHg)	del	ivery (cc)		Pre-str.	<u> </u>	mm
End stop	90	0	28.	.5 - 30	0.5						Contro	<u>l lever</u>	angle
	60	0	27.	.1 - 3:	1.1						α	19° -	27° deg
	230	0	26.	8 - 3	0.8						A	8.7 -	12.9 mm
	260	0	15.	0 - 22	2.0						β	37° -	47° deg
	280	0	be	elow !	5.0						В	11.5 -	15.2 mm
										Í	Y	10.5°-	11.5°deg
											С	5.7 -	6.3 mm
Switch off	32	5		0									
	90	0	<u> </u>	0		-	·						
Idle	35	0	5.	3 - 9	9.3								
stop	50	0	be	low 4	4.0	_							
Partial load	90	0	2.	5 - 12	2.5			<u> </u>					
2-5	Cut-in	volt	age max	.: 8V									
Solenoid	Test vo	oltag	e: 12 -	14V						ļ	1		

F13

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ZEXEL - Test specifications Injection pumps



ZEXEL - Test specifications **F14** Injection pumps







6 = Controll leve 7 = Intermediate lever

9 = Idling set bracket

M-CSD ADJUSTMENT

1. CSD Adjustment

1) Hold the control lever (6) in the idling position.

2) Move the CSD lever (5) to the right until it contacts the stopper (4).

3) Then, adjust the position of the screw (2) so that the timer stroke is 1.6 mm and fix the screw (2) using the nut.

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ZEXEL - Test specifications Injection pumps



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F 10	Injection pumps	



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(Continued)

## 2. Fixing the Intermediate Lever Adjustment Screw

- 1) Hold the CSD lever (5) in the position described in item 1 (timer stroke: 1.6 mm).
- 2) Move the intermediate lever (7) toward "X" and confirm that it contacts the stopper (8).
- Then, adjust the screw (3) so that the CSD lever (5) contacts the screw (3) and fix the screw (3) using the nut.
- 4) Return the intermediate lever (7) to its original position and confirm that the timer stroke is 0 mm.

#### 3. Screw (1) Adjustment

ZEXEL - Test specifications

Injection pumps

- Move the intermediate lever (7) toward "X" until it contacts the stopper (8).
- 2) Adjust the position of the screw (1) so that the gap between the idling set bracket (9) and screw (10) is 6  $\pm$  0.5 mm, and fix screw (1) using the nut.
- 3) Then, confirm that the gap between the control lever (6) and screw (1) is approximately 1.7 mm.





## 104769-2175 3/3

- 1 = Idling stopper bolt
- 2 = Dash pot
- 3 = Dash pot adjusting screw
- 4 = Bracket
- 5 = Block gauge
- 6 = Control lever

DASH POT ADJUSTMENT

1. Insert a block gauge (thickness gauge) of thickness 2.7  $\pm$  0.05 mm in the gap between the idling stopper bolt and the bracket.



## (Continued)

2. With the control lever positioned as described in item 1., adjust the dashpot adjusting screw so that the dashpot adjusting screw and the pushrod are in contact. Fix the screw using the nut.

## Caution:

- The adjusting screw and the pushrod must move together smoothy.
- Confirm that the control lever returns to the idling position.



